

**BETHLEHEM  
STRUCTURAL  
SHAPES**



MAY 9 1961

Mill  
Practices



I  
BWF

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WF&BL

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BJ&BS

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STD

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ANGLES

L  
PILING

T  
TEES

C  
CAR &  
SHIP

L  
BULB

L  
CAR

L  
ZEEs

INDEX

# BETHLEHEM STRUCTURAL SHAPES

INFORMATION AND TABLES FOR  
*Architects, Engineers, and Designers*  
OF BUILDINGS AND OTHER STEEL STRUCTURES



BETHLEHEM STEEL COMPANY

*General Offices: BETHLEHEM, PA.*

CATALOG S-58



For strength  
... economy  
... versatility

*Rolling Schedules and Supplementary Information  
are being issued from time to time. This information  
may be obtained from our nearest Sales Office.  
Consult us on your requirements.*

## *General Information*

This catalog gives information on structural sections which are included in Simplified Practice Recommendation R 216-46 for Hot-Rolled Carbon Steel Structural Shapes, approved by the United States Department of Commerce through the National Bureau of Standards. It supersedes all previous Bethlehem publications relating to structural shapes.

All shapes that are not noted as "Special" are rolled at frequent intervals and are readily obtainable from the mill in lots of any size. For this reason, the selection of these shapes, which are shown under Part I, is recommended.

Shapes noted as "Special" under Part II are generally used for special purposes, and consequently the rollings may be irregular and infrequent. When required tonnage of any of these shapes is comparatively small, it may be advantageous to use the nearest size shown under Part I. Before ordering any of these sizes consult the nearest sales office for delivery information.

Certain Bethlehem wide-flange sections have a 5 pct slope on the inside faces of the flanges and others have flanges whose inside and outside faces are parallel to each other. The light beams, joists and stanchions have a 2 pct slope on the inside faces of the flanges.

The radii of fillets and roundings shown are those to which the rolls are turned. The wear on rolls during process of rolling is likely to change these fillets and roundings so that proper allowance should be made for any fittings affected by such changes.

In computing the weights and properties of Bethlehem wide-flange shapes, light beams, joists and stanchions, the fillets have been included. In computing the weights of standard I-beams, channels and shipbuilding bulb angles, the actual profiles have been used, including the fillets and the roundings, while in computing the weights of angles, zees and car-building bulb angles, the fillets and the roundings are not included. The properties of shipbuilding bulb angles and their areas are based upon the exact profiles. In computing the published areas and properties of standard I-beams and channels and also of all angles, zees and car-building bulb angles, the fillets and the roundings are not included. These methods are in accordance with industry standards.

The rolling and cutting tolerances shown in this catalog are in accordance with accepted standards.

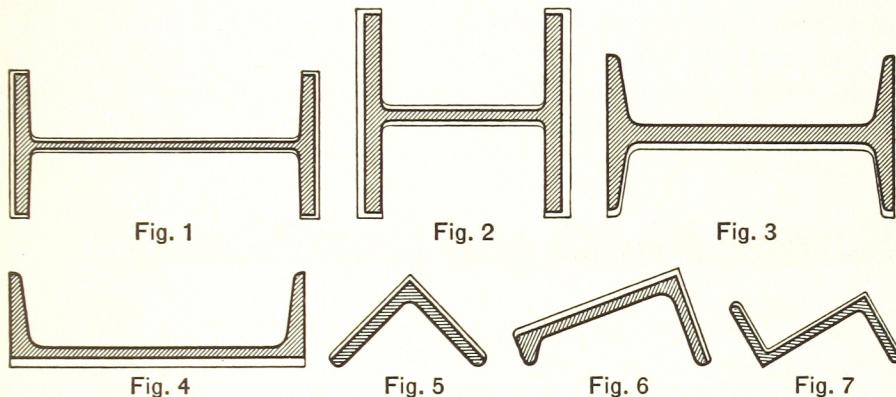


All structural shapes in this catalog are rolled of steel conforming to American Society for Testing Materials specifications. Material conforming to other specifications may be furnished by special arrangement.

Weights of rolled-steel shapes are computed on the basis that 1 cu ft of steel weighs 489.6 lb, and 3.4 times the sectional area in sq in. equals the weight per lin ft of the section.

The dimensions and weights of shapes published in this catalog are theoretical and are subject to the usual variations.

In the tables under the caption "Section Number and Nominal Size," the notations given in bold type are the manufacturer's standard nomenclature for the respective section groups. These are shown for convenience of identification in estimating, ordering, and for rolling purposes.



The beams and channels shown on pp 32 to 39 conform to industry standards. The terms "standard" and "American standard" are almost universally used in connection with this series of shapes.

Figs. 1 and 2 illustrate the method of increasing the areas and weights of Bethlehem wide-flange shapes, whereby the thickness of both flange and web may be changed with a corresponding change in the beam depth and flange width. The areas and weights of standard I-beams and channels are increased from the minimum as shown by Figs. 3 and 4, whereby an equal amount is added to the thickness of the webs and to the widths of the flanges, all other dimensions remaining unchanged. In the case of angles as shown in Fig. 5, equal increments are added to the thickness of each leg, which also slightly increases the length of each leg. The areas and weights of bulb angles are increased from the minimum or base sizes as shown by Fig. 6 and are founded upon a method which increases the thickness of the web to an extent twice as great as that of the flange. Fig. 7 shows the method of increasing the areas and weights of zees.

## STANDARD MILL PRACTICES

### *Rolling and Cutting Tolerances*

During the production of rolled structural shapes there is a certain amount of roll wear that causes the finished pieces to vary from the theoretical or published dimensions to which the rolls are turned. This roll wear begins as soon as the pieces enter the rolls and continues until the rolling is completed. To make the proper allowance for this roll wear, certain standard rolling tolerances have been established which the rolling mills should meet. These tolerances are shown on pp 6 to 8, inclusive. Any other tolerances are subject to special negotiations with the mill. Diagrams are exaggerated for clarity.

### *Surface Finish and Conditioning*

During the process of pouring ingots, splashings of molten metal sometimes cling to the inside of the mold, and as the hot metal rises it picks up these cold splashings which later show up in the form of minor surface imperfections. These imperfections are of minor importance and in general do not affect the full utility of the piece. To determine the extent of any imperfection, it is chipped out, and then if not serious, is filled with weld metal and ground down to make a workmanlike finish. The limitations covering this procedure are shown on p 10.

### *Cambering*

At the present time many beam bridges are being erected to specifications calling for cambering to various dimensions. Experience over many years has taught the mills the limitations to which they can camber various sizes of beams. Tables covering these limitations are shown on p 11. Cambering of any sizes not included in these tables must be referred to the mill on inquiry.

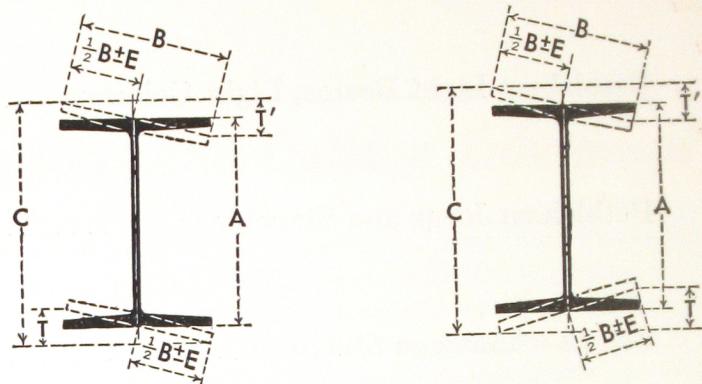
## TABLE OF CONTENTS

	PAGE
	Bethlehem Wide-Flange Shapes ..... 14....
	Bethlehem Light Beams, Light Columns ..... 28....
	Bethlehem Joists and Stanchions ..... 30....
	Beams—American Standard ..... 32....
	Channels—American Standard ..... 36....
	Angles—Equal Legs and Unequal Legs ..... 40....
	Bethlehem Steel Sheet Piling, Bearing Piles ..... 46, 48
	Structural Tees ..... 49....
	Special Channels—Car Building, Shipbuilding ..... 58....
	Special Bulb Angles—Shipbuilding, Car Building .. 64, 66
	Special Car Building Sections ..... 67....
	Special Zees ..... 68....
	Index ..... 72....



# STANDARD MILL PRACTICES

## Bethlehem Wide-Flange Shapes



### ROLLING TOLERANCES, INCHES

Section Nominal Size	A Depth		B Flange Width		T + T' Flanges Out-of-Square	E Web Off Center	C Max Depth at any Cross Section Over Theor Depth
	Over Theor	Under Theor	Over Theor	Under Theor			
	1/8	1/8	1/4	3/16			
Up to 12, incl	1/8	1/8	1/4	3/16	3/16 max	3/16 max	1/4
Over 12	1/8	1/8	1/4	3/16	1/4 max	3/16 max	1/4

(A) is measured at center line of web. (B) is measured parallel to flange. (C) is measured parallel to web.

### CUTTING TOLERANCES, INCHES

Nominal Depth	Variations from Specified Length for Lengths Given			
	To 30 ft incl		Over 30 ft	
	Over	Under	Over	Under
Beams up to 24, incl	3/8	3/8	3/8 plus 1/16 for each additional 5 ft or fraction thereof.	3/8
Beams over 24 and all Columns	1/2	1/2	1/2 plus 1/16 for each additional 5 ft or fraction thereof.	1/2

### OTHER TOLERANCES

**VARIATION IN WEIGHT:** The tolerance for the calculated or specified weight is  $\pm 2.5$  pct.

**ENDS OUT-OF-SQUARE:**  $\frac{1}{64}$  in. per in. of depth, or of flange width, if it is greater than depth.

**MILLING:** For sections which are ordered to be milled by the producer, customer should state on orders whether one or both ends are to be milled, and state definitely what finished length is required.

On sections milled one end only, standard length tolerances will apply.

On sections milled two ends, length tolerance will be  $\pm \frac{1}{16}$  in. for lengths up to 30 ft, and  $\pm \frac{3}{32}$  in. for lengths 30 ft to 50 ft.

On sections to be milled, we will add to finished length the mill's standard allowance for milling, from  $\frac{1}{4}$  in. to  $\frac{1}{8}$  in., depending on section and length, and invoice will be rendered on basis of finished length plus the required allowance for milling.

**OUT-OF-STRAIGHT:** Camber or sweep =  $\frac{1}{8}$  in.  $\times$   $\frac{\text{number of feet of total length}}{10^*}$

When certain sections<sup>†</sup> with flange width approximately equal to depth are specified on order as columns,

Lengths to 45 ft incl:  $\frac{1}{8}$  in.  $\times$   $\frac{\text{total length in feet}}{10}$  but not over  $\frac{3}{8}$  in.

Lengths over 45 ft:  $\frac{1}{8}$  in. +  $\frac{1}{8}$  in.  $\times$   $\frac{\text{total length in feet} - 45}{10}$

\* Figure is 5 for sweep when flange width is less than 6 in.

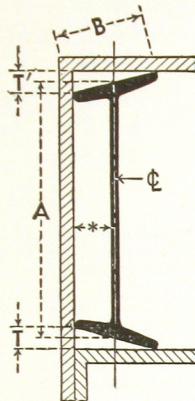
† Applies only to: 8-in.-deep Sections 31 lb per ft and heavier 12-in.-deep Sections 65 lb per ft and heavier

10-in.-deep Sections 49 lb per ft and heavier 14-in.-deep Sections 78 lb per ft and heavier

If other sections are specified on order as columns, tolerance will be subject to negotiation with the producer.

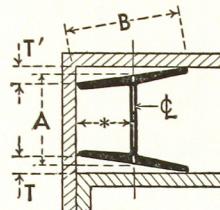
# STANDARD MILL PRACTICES

## American Standard Beams and Channels Car and Ship Channels Standard Mill H-Beams

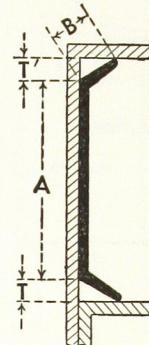


American Standard Beams

\* Back of square and  $\frac{C}{2}$  of web to be parallel when measuring "out-of-square."



Standard Mill H-Beams



Channels

$T + T'$  applies when flanges of channels are toed in or out.

### ROLLING TOLERANCES, INCHES

Section	Nominal Size	A Depth†		B Flange Width		$T + T'$ Out-of-Square Per In. of B, in.
		Over Theor	Under Theor	Over Theor	Under Theor	
American Standard Beams	3 to 7, incl	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{1}{32}$
	Over 7 to 14, incl	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{5}{32}$	$\frac{3}{32}$	$\frac{1}{32}$
	Over 14 to 24, incl	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{32}$
Standard Mill H-Beams	4	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{1}{32}$
	5	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{5}{32}$	$\frac{3}{32}$	$\frac{1}{32}$
	6 and 8	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{32}$
Channels	3 to 7, incl	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{1}{32}$
	Over 7 to 14, incl	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{1}{32}$
	Over 14	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{32}$

† (A) is measured at center line of web for beams; and at back of web for channels.

### CUTTING TOLERANCES, INCHES

All Standard Sections	To 30 ft, incl		Over 30 ft to 40 ft, incl		Over 40 ft to 50 ft, incl		Over 50 ft to 65 ft, incl		Over 65 ft	
	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under
	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{4}$	1	$\frac{1}{4}$	$1\frac{1}{8}$	$\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{4}$

### OTHER TOLERANCES

**VARIATION IN WEIGHT:** The tolerance for the calculated or specified weight is  $\pm 2.5$  pct.

**ENDS OUT-OF-SQUARE:**  $\frac{1}{4}$  in. per in. of depth.

**OUT-OF-Straight:**

$$\text{Camber} = \frac{1}{6} \text{ in.} \times \frac{\text{number of feet of total length}}{5}$$

**Sweep:** Due to the extreme variations in flexibility of standard beams and channels about the Y-Y axis, straightness tolerances for sweep are subject to negotiation between purchaser and producer for the individual sections involved, but will in no case be less than the established straightness tolerance for camber for such sections.

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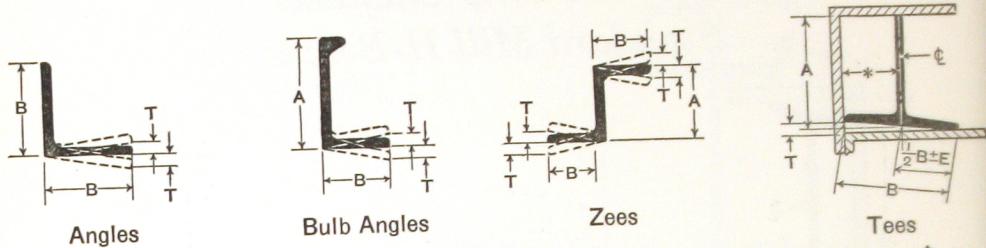
C  
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ZEEZ

INDEX

# STANDARD MILL PRACTICES

## Angles, Bulb Angles, Zees and Tees



\* Back of square and  $\frac{C}{2}$  of stem to be parallel when measuring "out-of-square."

### ROLLING TOLERANCES, INCHES

Section	Nominal Size	A		B		T	E		
		Depth		Flange Width or Length of Leg					
		Over Theor	Under Theor	Over Theor	Under Theor				
Angles†	3 to 4, incl	....	....	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{3}{128}^{**}$	....		
	Over 4 to 6, incl	....	....	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{128}^{**}$	....		
	Over 6	....	....	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{128}^{**}$	....		
Bulb Angles	Depth 3 to 4, incl	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{3}{128}^{**}$	....		
	Over 4 to 6, incl	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{128}^{**}$	....		
	Over 6	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{128}^{**}$	....		
Rolled Tees	Stem or Flange 5 and under	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{3}{32}$ max		
	Stem or Flange Over 5 to 7	$\frac{3}{32}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{8}$ max		
Zees	3 to 4, incl	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{32}$	$\frac{3}{128}^{**}$	....		
	Over 4 to 6, incl	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{128}^{**}$	....		

(A) is measured at center line of stem for tees. \*\*  $\frac{3}{128}$  in. per in. =  $1\frac{1}{2}$  deg.

† For unequal leg angles, longer leg determines classification.

### CUTTING TOLERANCES, INCHES

All Standard Sections	To 30 ft, incl		Over 30 ft to 40 ft, incl		Over 40 ft to 50 ft, incl		Over 50 ft to 65 ft, incl		Over 65 ft	
	Over	Under	Over	Under	Over	Under	Over	Under	Over	Under
	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{4}$	1	$\frac{1}{4}$	$1\frac{1}{8}$	$\frac{1}{4}$	$1\frac{1}{4}$	$\frac{1}{4}$

### OTHER TOLERANCES

**VARIATION IN WEIGHT:** The tolerance for the calculated or specified weight is  $\pm 2.5$  pct.

**ENDS OUT-OF-SQUARE:** Angles††  $-\frac{3}{128}$  in. per in. of leg length or  $1\frac{1}{2}$  deg.

Bulb Angles  $-\frac{3}{128}$  in. per in. of depth or  $1\frac{1}{2}$  deg.

Rolled Tees††  $-\frac{1}{64}$  in. per in. of flange or stem.

Zees  $-\frac{3}{128}$  in. per in. of sum of both flange lengths.

**OUT-OF-Straight:**

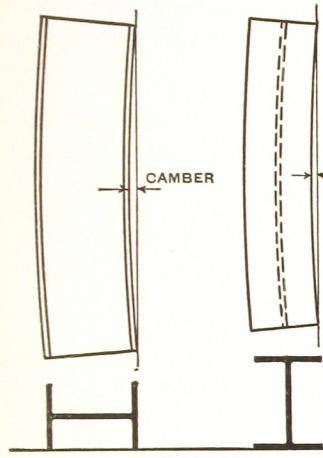
$$\text{Camber} = \frac{1}{8} \text{ in.} \times \frac{\text{number of feet of total length}}{5}$$

†† Tolerances for ends out-of-square are determined on the longer members of the section.

# STANDARD MILL PRACTICES

## Positions for Measuring Camber and Sweep

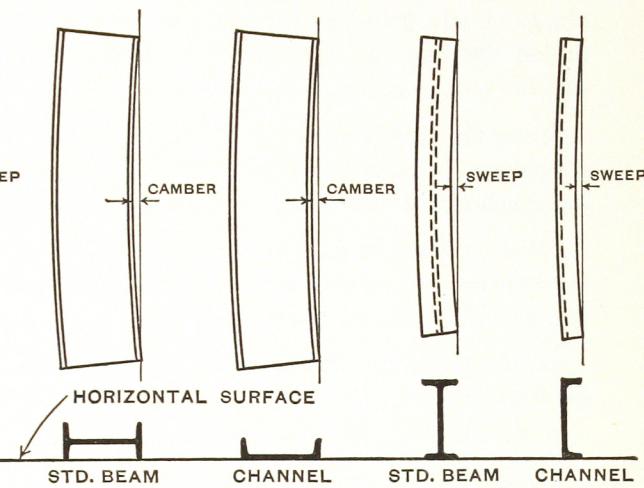
BETHLEHEM  
WF BEAMS



Camber

Sweep

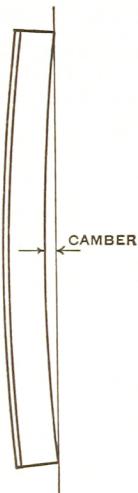
AMERICAN STANDARD  
BEAMS AND CHANNELS



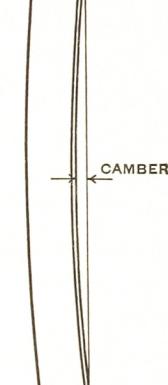
Camber

Sweep

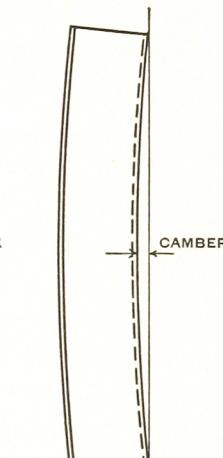
Camber



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INDEX

## STANDARD MILL PRACTICES

### *Surface Finish*

**Surface Finish and Conditioning.** Correcting minor imperfections at any location in structural shapes and piling sections by grinding or by chipping and grinding to sound metal and depositing weld metal by arc-fusion welding, in accordance with the limitations prescribed below, is regular mill practice.

Imperfections that do not affect the full utility of the piece, shall not be considered as injurious defects. Such pieces may be processed by the following methods in order to give them a workmanlike finish.

(1) For material less than  $\frac{3}{8}$  in. in nominal thickness, when the imperfections are not more than  $\frac{1}{32}$  in. in depth, they may be removed by grinding, or chipping and grinding.

(2) For material  $\frac{3}{8}$  in. and over in nominal thickness, when the imperfections are not more than  $\frac{1}{16}$  in. in depth, they may be removed by grinding, or chipping and grinding.

(3) For material  $\frac{3}{8}$  in. and over in nominal thickness, when the imperfections are more than  $\frac{1}{16}$  in. in depth, such imperfections may be removed by chipping and the depression filled by depositing weld metal under limiting conditions, as follows:

(a) The cross-sectional area of any piece at any location shall not be reduced more than 1.5 pct, nor shall the total area of the chipped surface of any piece exceed 2 pct of the total surface area of that piece.

(b) After removal of any imperfections preparatory to welding, the thickness of the material at any location must not be reduced by more than 20 pct of the nominal thickness of the shape.

(c) The interlock of any sheet-piling section may be conditioned by welding and grinding to correct or build up the interlock at any location not to exceed 2 pct of the total surface area or length of that piece.

(d) An experienced mill inspector shall inspect the work to see that the defects have been completely removed and that the limitation specified in items (a), (b) and (c) have not been exceeded.

(e) All welding shall be performed by qualified welding operators using suitable coated mild-steel electrodes. The welds shall be sound; the weld metal being thoroughly fused on all surfaces and edges without undercutting or overlap. Weld metal shall project at least  $\frac{1}{16}$  in. above the rolled surface after welding, and the projecting metal shall be removed by grinding, or chipping and grinding, to make it flush with the rolled surface and produce a workmanlike finish.

# STANDARD MILL PRACTICES

## Cambering of Rolled Beams

The following information covers the limitations upon cold-cambering of deep beams at the mill.

Maximum length for cambering is 100 ft.

Maximum camber, measured at mid-length, is shown in the table below:

Sections	Maximum Camber, in.								
	5	4½	4	3½	3	2½	2	1½	1
	Length, ft								
24-in. Wide Flange and over	85	75	65	55	50	45	40	35	30
21-in. Wide Flange 24-in. Standard	80	70	60	50	45	40	35	30	25

Camber will approximate a simple regular curve nearly the full length of the beam, or between any two points on beam as specified. Reverse or other compound curves will not be undertaken. Camber shall be specified by the ordinate at mid-length of the portion of the beam to be curved (cambered). Ordinates at other points shall not be specified. The camber is subject to a tolerance as follows:

	Lengths 50 ft and less	plus tolerance	minus tolerance
		½ in.	0
	Lengths over 50 ft	½ in. + ⅛ in. for each 10 ft or fraction thereof in excess of 50 ft	0

When a small amount of camber is specified some of it may be lost due to the release of stresses that result from the cold work in cambering. It has been determined by experience that certain minimum amounts of camber are likely to remain permanent, as shown in table below:

Wide Flange Sections in.	Minimum Camber Likely to Remain Permanent in.								
	30 ft Length	35 ft Length	40 ft Length	45 ft Length	50 ft Length	55 ft Length	65 ft Length	75 ft Length	85 ft Length
36	½	½	¾	1	1¼	1½	2¼	3	3¾
33	½	¾	1	1¼	1½	1¾	2½	3¼	4
30	½	¾	1	1¼	1½	2	2¾	3½	4½
27	¾	1	1	1½	1¾	2	3	4	5
24	¾	1	1¼	1½	2	2½	3¼	4½	5

Wide Flange Sections and Standard Beams	Minimum Camber Likely to Remain Permanent in.								
	25 ft Length	30 ft Length	35 ft Length	40 ft Length	45 ft Length	50 ft Length	60 ft Length	70 ft Length	80 ft Length
21-in. WF	½	¾	1	1½	1¾	2¼	3¼	4½	5
24-in. Standard	½	¾	1	1¼	1½	2	2¾	3¾	5

While cambers less than shown in this table can be furnished, no guarantee can be given with respect to their permanency. In some cases sections other than those listed in the table may be cambered within certain limits. All special cambering not listed in the above tables must be submitted for inquiry and negotiation and the terms of the order will govern.

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## LIST OF SYMBOLS

- A Area in square inches
- b Flange width, inches and decimals
- b' Flange width, inches and fractions, approximate
- D Diagonal dimension, inches and fractions, approximate
- d Depth, inches and decimals
- d' Depth, inches and fractions, approximate
- g-g' Distance center of gravity from neutral axes
- I Moment of inertia about major axis X-X
- I' Moment of inertia about minor axis Y-Y
- R Radius of fillets at root—\_inches and decimals
- R', R'', R''' Radius of roundings, inches
  - r Radius of gyration about major axis X-X, inches
  - r' Radius of gyration about minor axis Y-Y, inches
  - r'' Radius of gyration about axis Z-Z, inches
- S Section modulus about major axis X-X
- S' Section modulus about minor axis Y-Y
- T Tangent distance on web between fillets
- T' Distance between points of tangency on inside face of flanges
- t Flange thickness, average—\_inches and decimals
- t' Flange thickness at toe—\_inches and fractions
- t'' Flange thickness at root—\_inches and fractions
- W Web thickness, inches and decimals
- W' Web thickness, inches and fractions

Deviations from the above symbols are indicated at the places of exception.

# SHAPES

## *Part I*

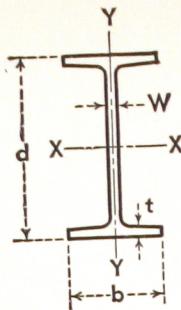
All sections shown on pp 14 to 56, inclusive, are rolled at frequent intervals, and comparatively prompt deliveries can be expected from the mill. It is therefore recommended that users, wherever possible, make their selection from this group. Furthermore, some of these sizes are carried in stock by fabricators and warehouses.

These pages cover information regarding Bethlehem Wide Flange Shapes, Bethlehem Light Beams and Light Columns, Bethlehem Solid-Web Joists, Bethlehem Stanchions, Standard Beams, Standard Channels, Standard Angles, Bethlehem Bearing Piles, Steel Sheet Piling, and Structural (Split Beam) Tees.

On p 48 are shown tables of dimensions, weights and properties of a series of Bethlehem Bearing Piles. The sections are obtained by spreading the rolls of corresponding wide-flange sections, and prompt deliveries can therefore be made.

The table covering Structural Tees, produced by splitting Beam Sections, appears on pp 49 to 56, inclusive. Prompt deliveries can be made of sizes shown in this table.

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[	STD
L	ANGLES
T	PILING
T	TEES
[	CAR & SHIP
L	BULB
L	CAR
L	ZEES
	INDEX



# BETHLEHEM WIDE-FLANGE SHAPES

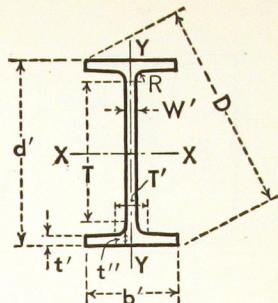
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Thickness	W		I	S	r	I'	S'	r'
				A	d	in.	in.	in.	in.	in.	in.	in.	in.
*B 36A	300 280 36" WF 36 x 16½	88.17	36.72	16.655	1.680	.945	20290.2	1105.1	15.17	1225.2	147.1	3.73	3.70
		82.32	36.50	16.595	1.570	.885	18819.3	1031.2	15.12	1127.5	135.9	3.65	3.62
		76.56	36.24	16.555	1.440	.845	17233.8	951.1	15.00	1020.6	123.3	3.62	3.59
		72.03	36.06	16.512	1.350	.802	16092.2	892.5	14.95	944.7	114.4	3.62	3.59
		67.73	35.88	16.475	1.260	.765	14988.4	835.5	14.88	870.9	105.7	3.59	3.59
*B 36	194 182 36" WF 36 x 12	57.11	36.48	12.117	1.260	.770	12103.4	663.6	14.56	355.4	58.7	2.49	2.47
		53.54	36.32	12.072	1.180	.725	11281.5	621.2	14.52	327.7	54.3	2.47	2.45
		49.98	36.16	12.027	1.100	.680	10470.0	579.1	14.47	300.6	50.0	2.45	2.42
		47.09	36.00	12.000	1.020	.653	9738.8	541.0	14.38	275.4	45.9	2.42	2.38
		44.16	35.84	11.972	.940	.625	9012.1	502.9	14.29	250.4	41.8	2.38	2.38
*B 33A	240 220 33 x 15¾	70.52	33.50	15.865	1.400	.830	13585.1	811.1	13.88	874.3	110.2	3.52	3.48
		64.73	33.25	15.810	1.275	.775	12312.1	740.6	13.79	782.4	99.0	3.48	3.43
		58.79	33.00	15.750	1.150	.715	11048.2	669.6	13.71	691.7	87.8	3.43	3.43
*B 33	152 141 33 x 11½	44.71	33.50	11.565	1.055	.635	8147.6	486.4	13.50	256.1	44.3	2.39	2.35
		41.51	33.31	11.535	.960	.605	7442.2	446.8	13.39	229.7	39.8	2.35	2.29
		38.26	33.10	11.510	.855	.580	6699.0	404.8	13.23	201.4	35.0	2.29	2.29
*B 30A	210 190 30 x 15	61.78	30.38	15.105	1.315	.775	9872.4	649.9	12.64	707.9	93.7	3.38	3.34
		55.90	30.12	15.040	1.185	.710	8825.9	586.1	12.57	624.6	83.1	3.34	3.30
		50.65	29.88	14.985	1.065	.655	7891.5	528.2	12.48	550.1	73.4	3.30	3.30
*B 30	132 124 30" WF 30 x 10½	38.83	30.30	10.551	1.000	.615	5753.1	379.7	12.17	185.0	35.1	2.18	2.16
		36.45	30.16	10.521	.930	.585	5347.1	354.6	12.11	169.7	32.3	2.16	2.12
		34.13	30.00	10.500	.850	.564	4919.1	327.9	12.00	153.2	29.2	2.12	2.06
		31.77	29.82	10.484	.760	.548	4461.0	299.2	11.85	135.1	25.8	2.06	2.06

\* These shapes have flange slope of 5 pct, and flange thicknesses shown are average thicknesses.

# BETHLEHEM WIDE-FLANGE SHAPES

Approximate Dimensions for Detailing



I  
WF&BL

I  
BJ&BS

I  
STD

L  
STD  
ANGLES

L  
PILING

T  
TEES

C  
CAR & SHIP

L  
BULB

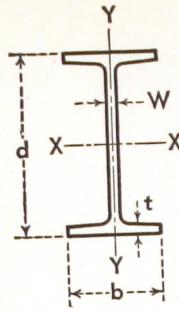
C  
CAR

L  
ZEEZ

INDEX

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent Web (Nominal)	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root							
			d'	b'	t'	t''						
	lb.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
3.73	300	36 $\frac{3}{4}$	16 $\frac{5}{8}$	1 $\frac{1}{2}$	1 $\frac{7}{8}$	1 $\frac{5}{16}$	31 $\frac{1}{8}$	2 $\frac{3}{4}$	40 $\frac{3}{8}$	.95	5.0	
3.70	*B36A	280	36 $\frac{1}{2}$	16 $\frac{5}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{4}$	31 $\frac{1}{8}$	2 $\frac{11}{16}$	40 $\frac{1}{8}$	.95	5.0	
3.65	36" WF	260	36 $\frac{1}{4}$	16 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{5}{8}$	31 $\frac{1}{8}$	2 $\frac{5}{8}$	39 $\frac{7}{8}$	.95	5.0	
3.62	36 x 16 $\frac{1}{2}$	245	36	16 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{9}{16}$	31 $\frac{1}{8}$	2 $\frac{5}{8}$	39 $\frac{3}{4}$	.95	5.0	
3.59		230	35 $\frac{7}{8}$	16 $\frac{1}{2}$	1 $\frac{11}{16}$	1 $\frac{7}{16}$	31 $\frac{1}{8}$	2 $\frac{9}{16}$	39 $\frac{1}{2}$	.95	5.0	
2.49												
2.47	*B36	194	36 $\frac{1}{2}$	12 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{7}{16}$	32 $\frac{1}{4}$	2 $\frac{3}{16}$	38 $\frac{1}{2}$	.75	5.0	
2.45	36" WF	182	36 $\frac{3}{8}$	12 $\frac{1}{8}$	1	1 $\frac{5}{16}$	32 $\frac{1}{4}$	2 $\frac{1}{8}$	38 $\frac{3}{8}$	.75	5.0	
2.42	36 x 12	170	36 $\frac{1}{8}$	12	1 $\frac{5}{16}$	1 $\frac{1}{4}$	32 $\frac{1}{4}$	2 $\frac{1}{8}$	38 $\frac{1}{8}$	.75	5.0	
2.38		160	36	12	$\frac{7}{8}$	1 $\frac{3}{16}$	32 $\frac{1}{4}$	2 $\frac{1}{16}$	38	.75	5.0	
		150	35 $\frac{7}{8}$	12	1 $\frac{3}{16}$	1 $\frac{1}{16}$	32 $\frac{1}{4}$	2 $\frac{1}{16}$	37 $\frac{7}{8}$	.75	5.0	
3.52	*B33A	240	33 $\frac{1}{2}$	15 $\frac{7}{8}$	1 $\frac{3}{16}$	1 $\frac{9}{16}$	7 $\frac{1}{8}$	28 $\frac{5}{8}$	2 $\frac{9}{16}$	37 $\frac{1}{8}$	.90	5.0
3.48	33" WF	220	33 $\frac{3}{4}$	15 $\frac{3}{4}$	1 $\frac{1}{16}$	1 $\frac{1}{2}$	28 $\frac{5}{8}$	2 $\frac{1}{2}$	36 $\frac{7}{8}$	.90	5.0	
3.43	33 x 15 $\frac{3}{4}$	200	33	15 $\frac{3}{4}$	1 $\frac{5}{16}$	1 $\frac{5}{16}$	28 $\frac{5}{8}$	2 $\frac{7}{16}$	36 $\frac{3}{8}$	.90	5.0	
2.39	*B33	152	33 $\frac{1}{2}$	11 $\frac{5}{8}$	1 $\frac{5}{16}$	1 $\frac{3}{16}$	5 $\frac{1}{8}$	29 $\frac{3}{4}$	1 $\frac{15}{16}$	35 $\frac{1}{2}$	.70	5.0
2.35	33" WF	141	33 $\frac{1}{4}$	11 $\frac{1}{2}$	1 $\frac{3}{16}$	1 $\frac{1}{8}$	5 $\frac{1}{8}$	29 $\frac{3}{4}$	1 $\frac{15}{16}$	35 $\frac{1}{4}$	.70	5.0
2.29	33 x 11 $\frac{1}{2}$	130	33 $\frac{1}{8}$	11 $\frac{1}{2}$	1 $\frac{1}{16}$	1	5 $\frac{1}{16}$	29 $\frac{3}{4}$	1 $\frac{15}{16}$	35 $\frac{1}{8}$	.70	5.0
3.38	*B30A	210	30 $\frac{3}{8}$	15 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{16}$	25 $\frac{3}{4}$	2 $\frac{3}{8}$	34	.85	5.0
3.34	30" WF	190	30 $\frac{1}{8}$	15	1	1 $\frac{3}{8}$	$\frac{3}{4}$	25 $\frac{3}{4}$	2 $\frac{5}{16}$	33 $\frac{3}{4}$	.85	5.0
3.30	30 x 15	172	29 $\frac{7}{8}$	15	$\frac{7}{8}$	1 $\frac{1}{4}$	1 $\frac{11}{16}$	25 $\frac{3}{4}$	2 $\frac{1}{4}$	33 $\frac{1}{2}$	.85	5.0
2.18	*B30	132	30 $\frac{1}{4}$	10 $\frac{1}{2}$	$\frac{7}{8}$	1 $\frac{1}{8}$	$\frac{5}{8}$	26 $\frac{7}{8}$	1 $\frac{7}{8}$	32 $\frac{1}{2}$	.65	5.0
2.16	30" WF	124	30 $\frac{1}{8}$	10 $\frac{1}{2}$	1 $\frac{3}{16}$	1 $\frac{1}{16}$	$\frac{5}{8}$	26 $\frac{7}{8}$	1 $\frac{13}{16}$	31 $\frac{1}{8}$	.65	5.0
2.12	30 x 10 $\frac{1}{2}$	116	30	10 $\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{9}{16}$	26 $\frac{7}{8}$	1 $\frac{13}{16}$	31 $\frac{3}{4}$	.65	5.0
2.06		108	29 $\frac{7}{8}$	10 $\frac{1}{2}$	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{9}{16}$	26 $\frac{7}{8}$	1 $\frac{13}{16}$	31 $\frac{1}{8}$	.65	5.0

\* These shapes have flange slope of 5 pct.



# BETHLEHEM WIDE-FLANGE SHAPES

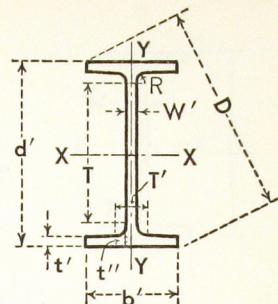
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thick-ness	AXIS X-X			AXIS Y-Y		
				Width	Thickness		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.		in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>
<b>*B27A</b>	177	52.10	27.31	14.090	1.190	.725	6728.6	492.8	11.36	518.9	73.7	3.16
27" WF	160	47.04	27.08	14.023	1.075	.658	6018.6	444.5	11.31	458.0	65.3	3.12
27 x 14	145	42.68	26.88	13.965	.975	.600	5414.3	402.9	11.26	406.9	58.3	3.09
<b>*B27</b>	114	33.53	27.28	10.070	.932	.570	4080.5	299.2	11.03	149.6	29.7	2.11
27" WF	102	30.01	27.07	10.018	.827	.518	3604.1	266.3	10.96	129.5	25.9	2.08
27 x 10	94	27.65	26.91	9.990	.747	.490	3266.7	242.8	10.87	115.1	23.0	2.04
<b>*B24B</b>	160	47.04	24.72	14.091	1.135	.656	5110.3	413.5	10.42	492.6	69.9	3.23
24" WF	145	42.62	24.49	14.043	1.020	.608	4561.0	372.5	10.34	434.3	61.8	3.19
24 x 14	130	38.21	24.25	14.000	.900	.565	4009.5	330.7	10.24	375.2	53.6	3.13
<b>*B24A</b>	120	35.29	24.31	12.088	.930	.556	3635.3	299.1	10.15	254.0	42.0	2.68
24" WF	110	32.36	24.16	12.042	.855	.510	3315.0	274.4	10.12	229.1	38.0	2.66
24 x 12	100	29.43	24.00	12.000	.775	.468	2987.3	248.9	10.08	203.5	33.9	2.63
<b>*B24</b>	94	27.63	24.29	9.061	.872	.516	2683.0	220.9	9.85	102.2	22.6	1.92
24" WF	84	24.71	24.09	9.015	.772	.470	2364.3	196.3	9.78	88.3	19.6	1.89
24 x 9	76	22.37	23.91	8.985	.682	.440	2096.4	175.4	9.68	76.5	17.0	1.85
<b>*B21B</b>	142	41.76	21.46	13.132	1.095	.659	3403.1	317.2	9.03	385.9	58.8	3.04
21" WF	127	37.34	21.24	13.061	.985	.588	3017.2	284.1	8.99	338.6	51.8	3.01
21 x 13	112	32.93	21.00	13.000	.865	.527	2620.6	249.6	8.92	289.7	44.6	2.96
<b>*B21A</b>	96	28.21	21.14	9.038	.935	.575	2088.9	197.6	8.60	109.3	24.2	1.97
21" WF	82	24.10	20.86	8.962	.795	.499	1752.4	168.0	8.53	89.6	20.0	1.93
<b>*B21</b>	73	21.46	21.24	8.295	.740	.455	1600.3	150.7	8.64	66.2	16.0	1.76
21" WF	68	20.02	21.13	8.270	.685	.430	1478.3	139.9	8.59	60.4	14.6	1.74
21 x 8 1/4	62	18.23	20.99	8.240	.615	.400	1326.8	126.4	8.53	53.1	12.9	1.71

\* These shapes have flange slope of 5 pct, and flange thicknesses shown are average thicknesses.

# BETHLEHEM WIDE-FLANGE SHAPES

## Approximate Dimensions for Detailing



I  
WF&BL

I  
BJ&BS

I  
STD

C  
STD

L  
ANGLES

L  
PILING

T  
TEES

C  
CAR & SHIP

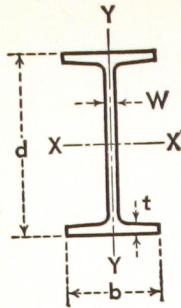
L  
BULB

C  
CAR

L  
ZEEZ

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent Web (Nominal)	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	W'						
			d'	b'	t'	t''						
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
3.16	*B 27A	177	27 1/4	14 1/8	1	1 1/8	3/4	23	2 1/4	30 3/4	.80	5.0
3.12	27" WF	160	27 1/8	14	7/8	1 1/4	1 1/16	23	2 9/16	30 1/2	.80	5.0
3.09	27 x 14	145	26 7/8	14	13/16	1 1/8	5/8	23	2 1/8	30 3/8	.80	5.0
2.11	*B 27	114	27 1/4	10 1/8	1 9/16	1 1/16	9/16	24	1 11/16	29 1/8	.60	5.0
2.08	27" WF	102	27 1/8	10	1 1/16	1 9/16	1/2	24	1 11/16	28 7/8	.60	5.0
2.04	27 x 10	94	26 7/8	10	5/8	7/8	1/2	24	1 3/4	28 3/4	.60	5.0
3.23	*B 24B	160	24 3/4	14 1/8	1 5/16	1 5/16	1 1/16	20 3/4	2	28 1/2	.70	5.0
3.19	24" WF	145	24 1/2	14	7/8	1 3/16	5/8	20 3/4	1 15/16	28 1/4	.70	5.0
3.13	24 x 14	130	24 1/4	14	3/4	1 1/16	9/16	20 3/4	1 7/8	28	.70	5.0
2.68	*B 24A	120	24 1/4	12 1/8	1 9/16	1 1/16	9/16	20 7/8	1 13/16	27 1/8	.65	5.0
2.65	24" WF	110	24 1/8	12	1 1/16	1	1/2	20 7/8	1 4/16	27	.65	5.0
2.63	24 x 12	100	24	12	5/8	1 5/16	1/2	20 7/8	1 11/16	26 7/8	.65	5.0
1.92	*B 24	94	24 1/4	9	3/4	1	1/2	21 3/8	17/16	25 7/8	.50	5.0
1.89	24" WF	84	24 1/8	9	1 1/16	7/8	1/2	21 3/8	17/16	25 3/4	.50	5.0
1.85	24 x 9	76	23 7/8	9	9/16	1 9/16	7/16	21 3/8	1 8/16	25 5/8	.50	5.0
3.04	*B 21B	142	21 1/2	13 1/8	1 5/16	1 1/4	1 1/16	17 3/4	17/8	25 1/4	.65	5.0
3.01	21" WF	127	21 1/4	13	1 3/16	1 1/8	9/16	17 3/4	1 13/16	25	.65	5.0
2.96	21 x 13	112	21	13	1 1/16	1	9/16	17 3/4	1 4/16	24 3/4	.65	5.0
1.97	*B 21A	96	21 1/8	9	1 3/16	1 1/16	9/16	18	1 5/8	23	.55	5.0
1.93	21" WF	82	20 7/8	9	1 1/16	1 5/16	1/2	18	1 9/16	22 3/4	.55	5.0
1.76	*B 21	73	21 1/4	8 1/4	5/8	1 3/16	1/2	18 5/8	1 8/16	22 7/8	.50	5.0
1.74	21" WF	68	21 1/8	8 1/4	9/16	3/4	7/16	18 5/8	1 8/16	22 3/4	.50	5.0
1.71	21 x 8 1/4	62	21	8 1/4	1/2	1 1/16	9/8	18 5/8	1 8/16	22 5/8	.50	5.0

\* These shapes have flange slope of 5 pct.



# BETHLEHEM WIDE-FLANGE SHAPES

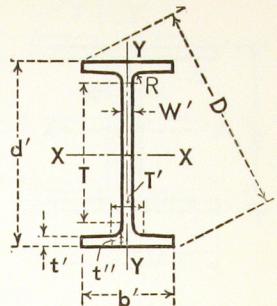
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Thickness		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.		in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>
<b>*B 18B</b> 18" WF 18 x 11 1/4	114	33.51	18.48	11.833	.991	.595	2033.8	220.1	7.79	255.6	43.2	2.76
	105	30.86	18.32	11.792	.911	.554	1852.5	202.2	7.75	231.0	39.2	2.73
	96	28.22	18.16	11.750	.831	.512	1674.7	184.4	7.70	206.8	35.2	2.71
<b>*B 18A</b> 18" WF 18 x 8 3/4	85	24.97	18.32	8.838	.911	.526	1429.9	156.1	7.57	99.4	22.5	2.00
	77	22.63	18.16	8.787	.831	.475	1286.8	141.7	7.54	88.6	20.2	1.98
	70	20.56	18.00	8.750	.751	.438	1153.9	128.2	7.49	78.5	17.9	1.95
	64	18.80	17.87	8.715	.686	.403	1045.8	117.0	7.46	70.3	16.1	1.93
<b>*B 18</b> 18" WF 18 x 7 1/2	60	17.64	18.25	7.558	.695	.416	984.0	107.8	7.47	47.1	12.5	1.63
	55	16.19	18.12	7.532	.630	.390	889.9	98.2	7.41	42.0	11.1	1.61
	50	14.71	18.00	7.500	.570	.358	800.6	89.0	7.38	37.2	9.9	1.59
<b>*B 16B</b> 16" WF 16 x 11 1/2	96	28.22	16.32	11.533	.875	.535	1355.1	166.1	6.93	207.2	35.9	2.71
	88	25.87	16.16	11.502	.795	.504	1222.6	151.3	6.87	185.2	32.2	2.67
<b>*B 16A</b> 16" WF 16 x 8 1/2	78	22.92	16.32	8.586	.875	.529	1042.6	127.8	6.74	87.5	20.4	1.95
	71	20.86	16.16	8.543	.795	.486	936.9	115.9	6.70	77.9	18.2	1.93
	64	18.80	16.00	8.500	.715	.443	833.8	104.2	6.66	68.4	16.1	1.91
	58	17.04	15.86	8.464	.645	.407	746.4	94.1	6.62	60.5	14.3	1.88
<b>*B 16</b> 16" WF 16 x 7	50	14.70	16.25	7.073	.628	.380	655.4	80.7	6.68	34.8	9.8	1.54
	45	13.24	16.12	7.039	.563	.346	583.3	72.4	6.64	30.5	8.7	1.52
	40	11.77	16.00	7.000	.503	.307	515.5	64.4	6.62	26.5	7.6	1.50
	36	10.59	15.85	6.992	.428	.299	446.3	56.3	6.49	22.1	6.3	1.45

\* These shapes have flange slope of 5 pct, and flange thicknesses shown are average thicknesses.

# BETHLEHEM WIDE-FLANGE SHAPES

## Approximate Dimensions for Detailing



I  
WF&BL

I  
BJ&BS

I  
STD

C  
STD

L  
ANGLES

T  
PILING

T  
TEES

C  
CAR & SHIP

L  
BULB

C  
CAR

L  
ZEEZ

ng  
r'  
in.

2.76  
2.73  
2.71

2.00  
1.98  
1.95  
1.93

1.63  
1.61  
1.59

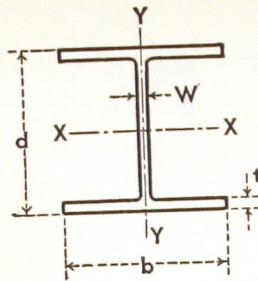
2.71  
2.67

1.95  
1.93  
1.91  
1.88

1.54  
1.52  
1.50  
1.45

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent Web (Nominal)	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			d'	b'	t'	t''						
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
*B 18B 18" WF 18 x 11 3/4	114 105 96	18 1/2 18 3/8 18 1/8	11 1/8 11 3/4 11 3/4	11 1/8 3/4 1 1/16	7/8 1 1/16 1	1 1/8 1 1/16 1/2	5/8 9/16 1/2	15 1/8 15 1/8 15 1/8	1 3/4 1 11/16 1 5/8	22 21 7/8 21 3/4	.60 .60 .60	5.0 5.0 5.0
*B 18A 18" WF 18 x 8 3/4	85 77 70 64	18 3/8 18 1/8 18 17 7/8	8 7/8 8 3/4 8 3/4 8 3/4	1 3/16 3/4 5/8 9/16	1 1 5/16 7/8 1 3/16	9/16 1/2 7/16 7/16	15 3/8 15 3/8 15 3/8 15 3/8	1 1/2 1 7/16 1 3/8 1 3/8	20 3/8 20 7/8 20 20	.50 .50 .50 .50	5.0 5.0 5.0 5.0	
*B 18 18" WF 18 x 7 1/2	60 55 50	18 1/4 18 1/8 18	7 1/2 7 1/2 7 1/2	5/8 9/16 1/2	1 3/16 3/4 1 1/16	7/16 3/8 3/8	15 7/8 15 7/8 15 7/8	1 3/16 1 1/8 1 1/8	19 7/8 19 5/8 19 1/2	.40 .40 .40	5.0 5.0 5.0	
*B 16B 16" WF 16 x 11 1/2	96 88	16 3/8 16 1/8	11 1/2 11 1/2	3/4 5/8	1 1 5/16	9/16 1/2	13 3/8 13 3/8	1 11/16 1 5/8	20 19 7/8	.60 .60	5.0 5.0	
*B 16A 16" WF 16 x 8 1/2	78 71 64 58	16 3/8 16 1/8 16 15 7/8	8 5/8 8 1/2 8 1/2 8 1/2	3/4 1 1/16 5/8 9/16	1 7/8 1 3/16 3/4	9/16 1/2 7/16 7/16	13 3/8 13 3/8 13 3/8 13 3/8	1 1/2 1 7/16 1 3/8 1 3/8	18 1/2 18 4/8 18 1/8 18	.50 .50 .50 .50	5.0 5.0 5.0 5.0	
*B 16 16" WF 16 x 7	50 45 40 36	16 1/4 16 1/8 16 15 7/8	7 1/8 7 7 7	9/16 1/2 7/16 3/8	1 1/16 5/8 9/16 1/2	3/8 3/8 5/16 5/16	14 14 14 14	1 1/8 1 1/8 1 1/16 1 1/16	17 3/4 17 8/8 17 1/2 17 8/8	.40 .40 .40 .40	5.0 5.0 5.0 5.0	

\* These shapes have flange slope of 5 pct.



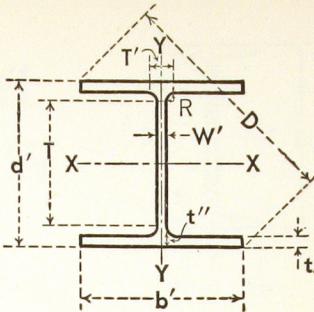
# BETHLEHEM WIDE-FLANGE SHAPES

*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thick-ness	AXIS X-X			AXIS Y-Y		
				Width	Thickness		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
<b>B14E</b> 14" WF 14 x 16	426	125.25	18.69	16.695	3.033	1.875	6610.3	707.4	7.26	2359.5	282.7	4.34
	398	116.98	18.31	16.590	2.843	1.770	6013.7	656.9	7.17	2169.7	261.6	4.31
	370	108.78	17.94	16.475	2.658	1.655	5454.2	608.1	7.08	1986.0	241.1	4.27
	342	100.59	17.56	16.365	2.468	1.545	4911.5	559.4	6.99	1806.9	220.8	4.24
	314	92.30	17.19	16.235	2.283	1.415	4399.4	511.9	6.90	1631.4	201.0	4.20
	287	84.37	16.81	16.130	2.093	1.310	3912.1	465.5	6.81	1466.5	181.8	4.17
	264	77.63	16.50	16.025	1.938	1.205	3526.0	427.4	6.74	1331.2	166.1	4.14
	246	72.33	16.25	15.945	1.813	1.125	3228.9	397.4	6.68	1226.6	153.9	4.12
	237	69.69	16.12	15.910	1.748	1.090	3080.9	382.2	6.65	1174.8	147.7	4.11
	228	67.06	16.00	15.865	1.688	1.045	2942.4	367.8	6.62	1124.8	141.8	4.10
	219	64.36	15.87	15.825	1.623	1.005	2798.2	352.6	6.59	1073.2	135.6	4.08
	211	62.07	15.75	15.800	1.563	.980	2671.4	339.2	6.56	1028.6	130.2	4.07
	202	59.39	15.63	15.750	1.503	.930	2538.8	324.9	6.54	979.7	124.4	4.06
	193	56.73	15.50	15.710	1.438	.890	2402.4	310.0	6.51	930.1	118.4	4.05
	184	54.07	15.38	15.660	1.378	.840	2274.8	295.8	6.49	882.7	112.7	4.04
	176	51.73	15.25	15.640	1.313	.820	2149.6	281.9	6.45	837.9	107.1	4.02
	167	49.09	15.12	15.600	1.248	.780	2020.8	267.3	6.42	790.2	101.3	4.01
<b>B14F</b> 14" WF Column Core	158	46.47	15.00	15.550	1.188	.730	1900.6	253.4	6.40	745.0	95.8	4.00
	150	44.08	14.88	15.515	1.128	.695	1786.9	240.2	6.37	702.5	90.6	3.99
	142	41.85	14.75	15.500	1.063	.680	1672.2	226.7	6.32	660.1	85.2	3.97
	320	94.12	16.81	16.710	2.093	1.890	4141.7	492.8	6.63	1635.1	195.7	4.17

All sections shown on this page have parallel-faced flanges.

# BETHLEHEM WIDE-FLANGE SHAPES



## Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange			Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange	
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root							
			d'	b'	t'	t''						
	lb	in.	in.	in.	in.	in.	W'	T	T'	in.	pct	
4.34	426	18 3/4	16 3/4	3 1/16	3 1/16	1 7/8	11 3/8	3 1/16	25 1/8	.60	0	
4.31	398	18 1/4	16 5/8	2 13/16	2 13/16	1 13/16	11 3/8	3	24 3/4	.60	0	
4.27	370	18	16 1/2	2 1/16	2 1/16	1 11/16	11 3/8	2 7/8	24 3/8	.60	0	
4.24	342	17 1/2	16 3/8	2 7/16	2 7/16	1 9/16	11 3/8	2 3/4	24	.60	0	
4.20	314	17 1/4	16 1/4	2 5/16	2 5/16	1 7/16	11 3/8	2 5/8	23 3/4	.60	0	
4.17	287	16 3/4	16 1/8	2 1/16	2 1/16	1 5/16	11 3/8	2 1/2	23 3/8	.60	0	
4.14	264	16 1/2	16	1 15/16	1 15/16	1 1/4	11 3/8	2 3/8	23	.60	0	
4.12	246	16 1/4	16	1 13/16	1 13/16	1 1/8	11 3/8	2 5/16	22 7/8	.60	0	
4.11	B 14E 14" WF	237	16 1/8	15 7/8	1 3/4	1 3/4	1 1/8	11 3/8	2 5/16	22 3/4	.60	0
4.10		228	16	15 7/8	1 11/16	1 11/16	1 1/16	11 3/8	2 1/4	22 3/8	.60	0
4.08		219	15 7/8	15 7/8	1 5/8	1 5/8	1	11 3/8	2 3/16	22 1/2	.60	0
4.07		211	15 3/4	15 3/4	1 9/16	1 9/16	1	11 3/8	2 3/16	22 3/8	.60	0
4.06		202	15 5/8	15 3/4	1 1/2	1 1/2	1 5/16	11 3/8	2 1/8	22 1/4	.60	0
4.05		193	15 1/2	15 3/4	1 7/16	1 7/16	7/8	11 3/8	2 1/16	22 1/8	.60	0
4.04		184	15 5/8	15 5/8	1 3/8	1 3/8	7/8	11 3/8	2	22	.60	0
4.02		176	15 1/4	15 5/8	1 5/16	1 5/16	1 3/16	11 3/8	2	21 7/8	.60	0
4.01		167	15 1/8	15 5/8	1 1/4	1 1/4	1 3/16	11 3/8	2	21 3/4	.60	0
4.00		158	15	15 1/2	1 3/16	1 3/16	3/4	11 3/8	1 15/16	21 5/8	.60	0
3.99		150	14 7/8	15 1/2	1 1/8	1 1/8	1 1/16	11 3/8	1 7/8	21 1/2	.60	0
3.97		142	14 3/4	15 1/2	1 1/16	1 1/16	1 1/16	11 3/8	1 7/8	21 1/2	.60	0
4.17	B 14F 14" WF Column Core	320	16 3/4	16 3/4	2 1/16	2 1/16	1 7/8	11 3/8	3 1/16	23 3/4	.60	0

All sections shown on this page have parallel-faced flanges.

I  
WF&BL

I  
BJ&BS

I  
STD

C  
STD  
ANGLES

T  
PILING

T  
TEES

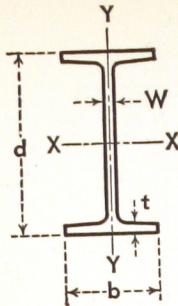
C  
CAR & SHIP

L  
BULB

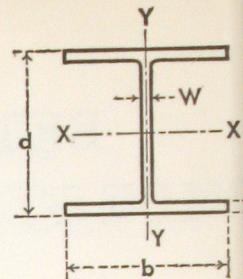
L  
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L  
ZEES

INDEX



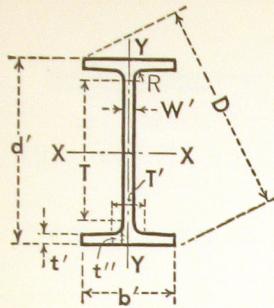
# BETHLEHEM WIDE-FLANGE SHAPES



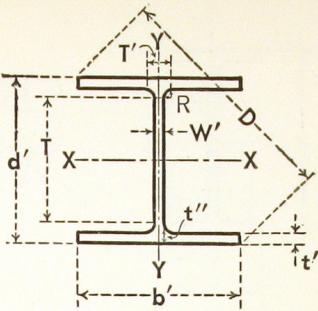
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y			
				Width	Thickness	W		I	S	r	I'	S'	r'	
				A	b	t		in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	
B 14D 14" WF 14 x 14½	136	39.98	14.75	14.740	1.063	.660	1593.0	216.0	6.31	567.7	77.0	3.77		
	127	37.33	14.62	14.690	.998	.610	1476.7	202.0	6.29	527.6	71.8	3.76		
	119	34.99	14.50	14.650	.938	.570	1373.1	189.4	6.26	491.8	67.1	3.75		
	111	32.65	14.37	14.620	.873	.540	1266.5	176.3	6.23	454.9	62.2	3.73		
	103	30.26	14.25	14.575	.813	.495	1165.8	163.6	6.21	419.7	57.6	3.72		
	95	27.94	14.12	14.545	.748	.465	1063.5	150.6	6.17	383.7	52.8	3.71		
	87	25.56	14.00	14.500	.688	.420	966.9	138.1	6.15	349.7	48.2	3.70		
	B 14C 14" WF 14 x 12		84	24.71	14.18	12.023	.778	.451	928.4	130.9	6.13	225.5	37.5	3.02
				78	22.94	14.06	12.000	.718	.428	851.2	121.1	6.09	206.9	34.5
B 14B 14" WF 14 x 10	74	21.76	14.19	10.072	.783	.450	796.8	112.3	6.05	133.5	26.5	2.48		
	68	20.00	14.06	10.040	.718	.418	724.1	103.0	6.02	121.2	24.1	2.46		
	61	17.94	13.91	10.000	.643	.378	641.5	92.2	5.98	107.3	21.5	2.45		
B 14A 14" WF 14 x 8	53	15.59	13.94	8.062	.658	.370	542.1	77.8	5.90	57.5	14.3	1.92		
	48	14.11	13.81	8.031	.593	.339	484.9	70.2	5.86	51.3	12.8	1.91		
	43	12.65	13.68	8.000	.528	.308	429.0	62.7	5.82	45.1	11.3	1.89		
*B 14 14" WF 14 x 6¾	38	11.17	14.12	6.776	.513	.313	385.3	54.6	5.87	24.6	7.3	1.49		
	34	10.00	14.00	6.750	.453	.287	339.2	48.5	5.83	21.3	6.3	1.46		
	30	8.81	13.86	6.733	.383	.270	289.6	41.8	5.73	17.5	5.2	1.41		

\* These shapes have flange slope of 5 pct, and flange thicknesses shown are average thicknesses.  
All other sections shown on this page have parallel-faced flanges.



# BETHLEHEM WIDE-FLANGE SHAPES



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange			Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange	
			d'	b'	Width (Nominal)							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct	
3.77	136	14 $\frac{3}{4}$	14 $\frac{3}{4}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	11 $\frac{3}{8}$	1 $\frac{7}{8}$	20 $\frac{7}{8}$	.60	0	
3.76	127	14 $\frac{5}{8}$	14 $\frac{3}{4}$	1	1	$\frac{5}{8}$	11 $\frac{3}{8}$	1 $\frac{13}{16}$	20 $\frac{3}{4}$	.60	0	
3.75	<b>B 14D</b>	119	14 $\frac{1}{2}$	14 $\frac{3}{8}$	1 $\frac{5}{16}$	1 $\frac{5}{16}$	$\frac{9}{16}$	11 $\frac{3}{8}$	1 $\frac{3}{4}$	20 $\frac{5}{8}$	.60	0
3.73	111	14 $\frac{3}{8}$	14 $\frac{3}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{9}{16}$	11 $\frac{3}{8}$	1 $\frac{3}{4}$	20 $\frac{1}{2}$	.60	0	
3.72	103	14 $\frac{1}{4}$	14 $\frac{3}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$	$\frac{1}{2}$	11 $\frac{3}{8}$	1 $\frac{11}{16}$	20 $\frac{1}{2}$	.60	0	
3.71	95	14 $\frac{1}{8}$	14 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	11 $\frac{3}{8}$	1 $\frac{11}{16}$	20 $\frac{1}{4}$	.60	0	
3.70	87	14	14 $\frac{1}{2}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	$\frac{7}{16}$	11 $\frac{3}{8}$	1 $\frac{5}{8}$	20 $\frac{1}{4}$	.60	0	
3.02	<b>B 14C</b>	84	14 $\frac{1}{8}$	12	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{16}$	11 $\frac{3}{8}$	1 $\frac{5}{8}$	18 $\frac{5}{8}$	.60	0
3.00	14" WF	78	14	12	1 $\frac{1}{16}$	1 $\frac{1}{16}$	$\frac{7}{16}$	11 $\frac{3}{8}$	1 $\frac{5}{8}$	18 $\frac{1}{2}$	.60	0
2.48	<b>B 14B</b>	74	14 $\frac{1}{4}$	10 $\frac{1}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$	$\frac{7}{16}$	11 $\frac{3}{8}$	1 $\frac{5}{8}$	17 $\frac{1}{2}$	.60	0
2.46	14" WF	68	14	10	1 $\frac{1}{16}$	1 $\frac{1}{16}$	$\frac{7}{16}$	11 $\frac{3}{8}$	1 $\frac{5}{8}$	17 $\frac{1}{4}$	.60	0
2.45	14 x 10	61	13 $\frac{7}{8}$	10	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{8}$	11 $\frac{3}{8}$	1 $\frac{1}{16}$	17 $\frac{1}{8}$	.60	0
1.92	<b>B 14A</b>	53	14	8	1 $\frac{1}{16}$	1 $\frac{1}{16}$	$\frac{3}{8}$	11 $\frac{3}{8}$	1 $\frac{1}{16}$	16 $\frac{1}{8}$	.60	0
1.91	14" WF	48	13 $\frac{3}{4}$	8	$\frac{9}{16}$	$\frac{9}{16}$	$\frac{3}{8}$	11 $\frac{3}{8}$	1 $\frac{1}{16}$	16	.60	0
1.89	14 x 8	43	13 $\frac{5}{8}$	8	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{16}$	11 $\frac{3}{8}$	1 $\frac{1}{2}$	15 $\frac{7}{8}$	.60	0
1.49	* <b>B 14</b>	38	14 $\frac{1}{8}$	6 $\frac{3}{4}$	$\frac{7}{16}$	$\frac{5}{8}$	$\frac{5}{16}$	12 $\frac{1}{8}$	1 $\frac{1}{16}$	15 $\frac{3}{4}$	.40	5.0
1.46	14" WF	34	14	6 $\frac{3}{4}$	$\frac{3}{8}$	$\frac{9}{16}$	$\frac{5}{16}$	12 $\frac{1}{8}$	1 $\frac{1}{16}$	15 $\frac{5}{8}$	.40	5.0
1.41	14 x 6 $\frac{3}{4}$	30	13 $\frac{7}{8}$	6 $\frac{3}{4}$	$\frac{5}{16}$	$\frac{7}{16}$	$\frac{5}{16}$	12 $\frac{1}{8}$	1	15 $\frac{1}{2}$	.40	5.0

\* These shapes have flange slope of 5 pct. All other sections shown on this page have parallel-faced flanges.

I  
WF&BL

I  
J&BS

I  
STD

C  
STD  
ANGLES

T  
PILING

T  
TEES

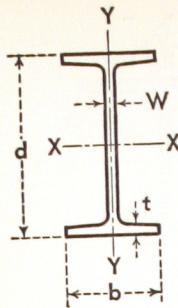
C  
CAR & SHIP

L  
BULB

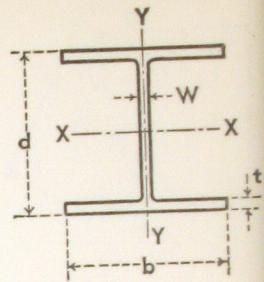
C  
CAR

Z  
ZEEs

INDEX



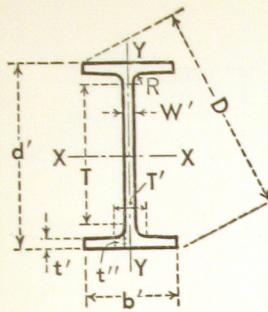
# BETHLEHEM WIDE-FLANGE SHAPES



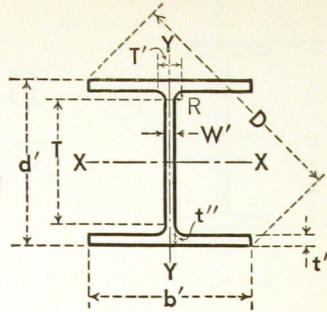
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Thickness	W		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	b	t	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
<b>B 12C</b> 12" WF 12 x 12	190 161 133 120 106 99 92 85 79 72 65	55.86 47.38 39.11 35.31 31.19 29.09 27.06 24.98 23.22 21.16 19.11	14.38 13.88 13.38 13.12 12.88 12.75 12.62 12.50 12.38 12.25 12.12	12.670 12.515 12.365 12.320 12.230 12.190 12.155 12.105 12.080 12.040 12.000	1.736 1.486 1.236 1.106 .986 .921 .856 .796 .736 .671 .606	1.060 .905 .755 .710 .620 .580 .545 .495 .470 .430 .390	1892.5 1541.8 1221.2 1071.7 930.7 858.5 788.9 723.3 663.0 597.4 533.4	263.2 222.2 182.5 163.4 144.5 134.7 125.0 115.7 107.1 97.5 88.0	5.82 5.70 5.59 5.51 5.43 5.40 5.38 5.34 5.31 5.28 5.28	589.7 486.2 389.9 345.1 278.2 256.4 235.5 216.4 195.3 174.6 174.6	93.1 77.7 63.1 56.0 45.7 42.2 38.9 35.8 32.4 29.1 29.1	3.25 3.20 3.16 3.13 3.11 3.08 3.07 3.05 3.04 3.02 3.02	
<b>B 12B</b> 12" WF 12 x 10	58 53	17.06 15.59	12.19 12.06	10.014 10.000	.641 .576	.359 .345	476.1 426.2	78.1 70.7	5.28 5.23	107.4 96.1	21.4 19.2	2.51 2.48	
<b>B 12A</b> 12" WF 12 x 8	50 45 40	14.71 13.24 11.77	12.19 12.06 11.94	8.077 8.042 8.000	.641 .576 .516	.371 .336 .294	394.5 350.8 310.1	64.7 58.2 51.9	5.18 5.15 5.13	56.4 50.0 44.1	14.0 12.4 11.0	1.96 1.94 1.94	
<b>*B 12</b> 12" WF 12 x 6½	36 31 27	10.59 9.12 7.97	12.24 12.09 11.96	6.565 6.525 6.500	.540 .465 .400	.305 .265 .240	280.8 238.4 204.1	45.9 39.4 34.1	5.15 5.11 5.06	23.7 19.8 16.6	7.2 6.1 5.1	1.50 1.47 1.44	

\* These shapes have flange slope of 5 pct, and flange thicknesses shown are average thicknesses.  
All other sections shown on this page have parallel-faced flanges.



# BETHLEHEM WIDE-FLANGE SHAPES



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	W'						
			d'	b'	t'	t''						
B 12C	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
	190	14 $\frac{1}{8}$	12 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{1}{16}$	9 $\frac{3}{4}$	2 $\frac{1}{4}$	19 $\frac{1}{4}$	.60	0	
	161	13 $\frac{7}{8}$	12 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{5}{16}$	9 $\frac{3}{4}$	2 $\frac{1}{8}$	18 $\frac{1}{4}$	.60	0	
	133	13 $\frac{3}{8}$	12 $\frac{3}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	3/4	9 $\frac{3}{4}$	1 $\frac{1}{5}/16$	18 $\frac{1}{4}$	.60	0	
	120	13 $\frac{1}{8}$	12 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	3/4	9 $\frac{3}{4}$	1 $\frac{1}{5}/16$	18	.60	0	
	106	12 $\frac{7}{8}$	12 $\frac{1}{4}$	1	1	5/8	9 $\frac{3}{4}$	1 $\frac{1}{3}/16$	17 $\frac{7}{8}$	.60	0	
	99	12 $\frac{3}{4}$	12 $\frac{1}{4}$	1 $\frac{5}{16}$	1 $\frac{5}{16}$	5/8	9 $\frac{3}{4}$	1 $\frac{3}{4}$	17 $\frac{3}{4}$	.60	0	
	92	12 $\frac{5}{8}$	12 $\frac{1}{8}$	7/8	7/8	9/16	9 $\frac{3}{4}$	1 $\frac{3}{4}$	17 $\frac{1}{2}$	.60	0	
	85	12 $\frac{1}{2}$	12 $\frac{1}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{16}$	1/2	9 $\frac{3}{4}$	1 $\frac{11}{16}$	17 $\frac{1}{2}$	.60	0	
	79	12 $\frac{3}{8}$	12 $\frac{1}{8}$	3/4	3/4	1/2	9 $\frac{3}{4}$	1 $\frac{11}{16}$	17 $\frac{3}{8}$	.60	0	
B 12B	72	12 $\frac{1}{4}$	12	1 $\frac{1}{16}$	1 $\frac{1}{16}$	7/16	9 $\frac{3}{4}$	1 $\frac{5}{8}$	17 $\frac{1}{4}$	.60	0	
	65	12 $\frac{1}{8}$	12	5/8	5/8	3/8	9 $\frac{3}{4}$	1 $\frac{1}{16}$	17 $\frac{7}{8}$	.60	0	
B 12A	58	12 $\frac{1}{4}$	10	5/8	5/8	3/8	9 $\frac{3}{4}$	1 $\frac{9}{16}$	15 $\frac{7}{8}$	.60	0	
	53	12	10	9/16	9/16	3/8	9 $\frac{3}{4}$	1 $\frac{9}{16}$	15 $\frac{7}{8}$	.60	0	
	40	12	8	1/2	1/2	5/16	9 $\frac{3}{4}$	1 $\frac{1}{2}$	14 $\frac{3}{8}$	.60	0	
*B 12	36	12 $\frac{1}{4}$	6 $\frac{5}{8}$	7/16	5/8	5/16	10 $\frac{3}{8}$	1	14	.35	5.0	
	31	12 $\frac{1}{8}$	6 $\frac{1}{2}$	3/8	9/16	1/4	10 $\frac{3}{8}$	1 $\frac{5}{16}$	13 $\frac{3}{4}$	.35	5.0	
	27	12	6 $\frac{1}{2}$	5/16	1/2	1/4	10 $\frac{3}{8}$	1 $\frac{5}{16}$	13 $\frac{5}{8}$	.35	5.0	

\* These shapes have flange slope of 5 pct.  
All other sections shown on this page have parallel-faced flanges.

I  
WF&BL

I  
BJ&BS

I  
STD

C  
STD

L  
ANGLES

L  
PILING

T  
TEES

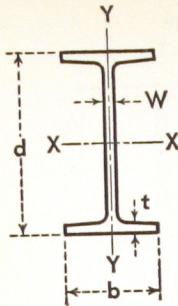
C  
CAR & SHIP

B  
BULB

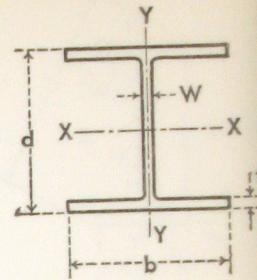
C  
CAR

Z  
ZEEZ

INDEX



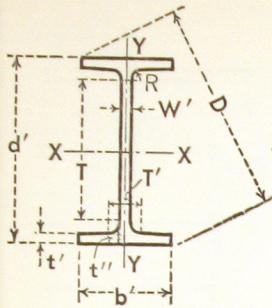
# BETHLEHEM WIDE-FLANGE SHAPES



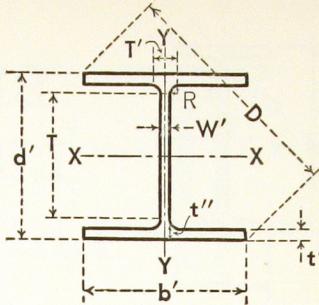
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Thickness	W		I	S	r	I'	S'	r'
				lb	in. <sup>2</sup>	in.		in.	in.	in.	in.	in.	in.
<b>B 10B</b> 10" WF 10 x 10	112	32.92	11.38	10.415	1.248	.755	718.7	126.3	4.67	235.4	45.2	2.67	
	100	29.43	11.12	10.345	1.118	.685	625.0	112.4	4.61	206.6	39.9	2.65	
	89	26.19	10.88	10.275	.998	.615	542.4	99.7	4.55	180.6	35.2	2.63	
	77	22.67	10.62	10.195	.868	.535	457.2	86.1	4.49	153.4	30.1	2.60	
	72	21.18	10.50	10.170	.808	.510	420.7	80.1	4.46	141.8	27.9	2.59	
	66	19.41	10.38	10.117	.748	.457	382.5	73.7	4.44	129.2	25.5	2.58	
	60	17.66	10.25	10.075	.683	.415	343.7	67.1	4.41	116.5	23.1	2.57	
	54	15.88	10.12	10.028	.618	.368	305.7	60.4	4.39	103.9	20.7	2.56	
	49	14.40	10.00	10.000	.558	.340	272.9	54.6	4.35	93.0	18.6	2.54	
<b>B 10A</b> 10" WF 10 x 8	45	13.24	10.12	8.022	.618	.350	248.6	49.1	4.33	53.2	13.3	2.00	
	39	11.48	9.94	7.990	.528	.318	209.7	42.2	4.27	44.9	11.2	1.98	
	33	9.71	9.75	7.964	.433	.292	170.9	35.0	4.20	36.5	9.2	1.94	
<b>*B 10</b> 10" WF 10 x 5 3/4	29	8.53	10.22	5.799	.500	.289	157.3	30.8	4.29	15.2	5.2	1.34	
	25	7.35	10.08	5.762	.430	.252	133.2	26.4	4.26	12.7	4.4	1.31	
	21	6.19	9.90	5.750	.340	.240	106.3	21.5	4.14	9.7	3.4	1.25	
<b>B 8B</b> 8" WF 8 x 8	67	19.70	9.00	8.287	.933	.575	271.8	60.4	3.71	88.6	21.4	2.12	
	58	17.06	8.75	8.222	.808	.510	227.3	52.0	3.65	74.9	18.2	2.10	
	48	14.11	8.50	8.117	.683	.405	183.7	43.2	3.61	60.9	15.0	2.08	
	40	11.76	8.25	8.077	.558	.365	146.3	35.5	3.53	49.0	12.1	2.04	
	35	10.30	8.12	8.027	.493	.315	126.5	31.1	3.50	42.5	10.6	2.03	
	31	9.12	8.00	8.000	.433	.288	109.7	27.4	3.47	37.0	9.2	2.01	
<b>B 8A</b> 8" WF 8 x 6 1/2	28	8.23	8.06	6.540	.463	.285	97.8	24.3	3.45	21.6	6.6	1.62	
	24	7.06	7.93	6.500	.398	.245	82.5	20.8	3.42	18.2	5.6	1.61	
<b>*B 8</b> 8" WF 8 x 5 1/4	20	5.88	8.14	5.268	.378	.248	69.2	17.0	3.43	8.50	3.2	1.20	
	17	5.00	8.00	5.250	.308	.230	56.4	14.1	3.36	6.72	2.6	1.16	

\* These shapes have flange slope of 5 pct, and flange thicknesses shown are average thicknesses.  
All other sections shown on this page have parallel-faced flanges.



# BETHLEHEM WIDE-FLANGE SHAPES



## Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange			Web Thickness (Nominal)	Tangent Web (Nominal)	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			d'	b'	t'						
B 10B	112	11 1/8	10 3/8	1 1/4	1 1/4	3/4	7 7/8	1 3/4	15 1/2	.50	0
	100	11 1/8	10 3/8	1 1/8	1 1/8	1 1/16	7 7/8	1 11/16	15 1/4	.50	0
	89	10 7/8	10 1/4	1	1	5/8	7 7/8	1 5/8	15	.50	0
	77	10 5/8	10 1/4	7/8	7/8	9/16	7 7/8	1 9/16	14 3/4	.50	0
	72	10 1/2	10 1/8	1 9/16	1 9/16	1/2	7 7/8	1 1/2	14 5/8	.50	0
	66	10 3/8	10 1/8	3/4	3/4	7/16	7 7/8	17/16	14 1/2	.50	0
	60	10 1/4	10 1/8	1 1/16	1 1/16	7/16	7 7/8	17/16	14 3/8	.50	0
	54	10 1/8	10	5/8	5/8	5/8	7 7/8	1 1/8	14 1/4	.50	0
	49	10	10	5/16	5/16	5/8	7 7/8	15/16	14 1/8	.50	0
B 10A	45	10 1/8	8	5/8	5/8	3/8	7 7/8	1 3/8	13	.50	0
10" WF	39	10	8	1/2	1/2	5/16	7 7/8	1 5/16	12 7/8	.50	0
10 x 8	33	9 3/4	8	7/16	7/16	5/16	7 7/8	1 5/16	12 5/8	.50	0
*B 10	29	10 1/4	5 3/4	7/16	9/16	5/16	8 1/2	7/8	11 3/4	.30	5.0
10" WF	25	10 1/8	5 3/4	3/8	1/2	1/4	8 1/2	1 3/16	11 5/8	.30	5.0
10 x 5 3/4	21	9 7/8	5 3/4	1/4	7/16	1/4	8 1/2	1 3/16	11 1/2	.30	5.0
B 8B	67	9	8 1/4	15/16	15/16	9/16	6 3/8	1 3/8	12 1/4	.40	0
	58	8 3/4	8 1/4	13/16	13/16	1/2	6 3/8	1 5/16	12	.40	0
	48	8 1/2	8 1/8	1 1/16	1 1/16	7/16	6 3/8	1 3/16	11 7/8	.40	0
	40	8 1/4	8 1/8	9/16	9/16	3/8	6 3/8	1 3/16	11 5/8	.40	0
	35	8 1/8	8	1/2	1/2	5/16	6 3/8	1 1/8	11 1/2	.40	0
	31	8	8	7/16	7/16	5/16	6 3/8	1 1/16	11 5/8	.40	0
B 8A	28	8	6 1/2	7/16	7/16	5/16	6 3/8	1 1/16	10 1/2	.40	0
8" WF	24	7 7/8	6 1/2	3/8	3/8	1/4	6 3/8	1 1/16	10 1/4	.40	0
*B 8	20	8 1/8	5 1/4	5/16	7/16	1/4	6 3/4	1 3/16	9 3/4	.30	5.0
8" WF	17	8	5 1/4	1/4	3/8	1/4	6 3/4	1 3/16	9 5/8	.30	5.0

\* These shapes have flange slope of 5 pct.  
All other sections shown on this page have parallel-faced flanges.

WF & BL

I  
B&BS  
STD

L  
STD  
ANGLES

L  
PILING

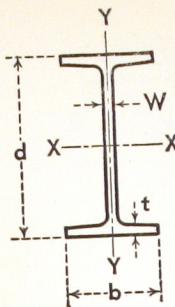
T  
TEES

L  
CAR & SHIP

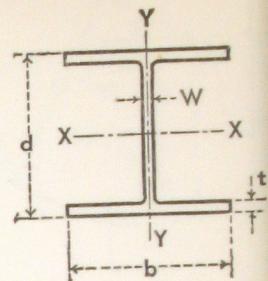
L  
BULB

L  
CAR

L  
ZEEZ



# BETHLEHEM LIGHT BEAMS LIGHT COLUMNS

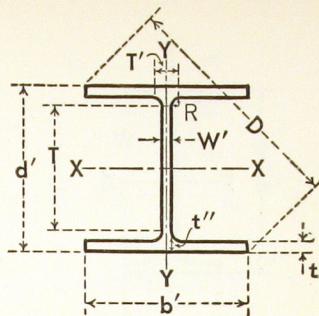
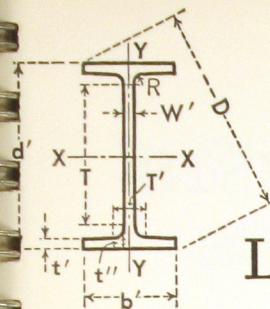


*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y		
				Width		Thickness		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	b	t	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
<b>†B 12L</b>	22	6.47	12.31	4.030	.424	.260	155.7	25.3	4.91	4.55	2.26	.84	
12" BL	19	5.62	12.16	4.010	.349	.240	130.1	21.4	4.81	3.67	1.83	.81	
12 x 4	16½	4.86	12.00	4.000	.269	.230	105.3	17.5	4.65	2.79	1.39	.76	
<b>†B 10L</b>	19	5.61	10.25	4.020	.394	.250	96.2	18.8	4.14	4.19	2.08	.86	
10" BL	17	4.98	10.12	4.010	.329	.240	81.8	16.2	4.05	3.45	1.72	.83	
10 x 4	15	4.40	10.00	4.000	.269	.230	68.8	13.8	3.95	2.79	1.39	.80	
<b>†B 8L</b>	15	4.43	8.12	4.015	.314	.245	48.0	11.8	3.29	3.30	1.65	.86	
8" BL	13	3.83	8.00	4.000	.254	.230	39.5	9.88	3.21	2.62	1.31	.83	
<b>†B 6L</b>	16	4.72	6.25	4.030	.404	.260	31.7	10.1	2.59	4.32	2.14	.96	
6" BL	12	3.53	6.00	4.000	.279	.230	21.7	7.24	2.48	2.89	1.44	.90	
<b>B 6</b>	25	7.37	6.37	6.080	.456	.320	53.5	16.8	2.69	17.1	5.6	1.52	
6" WF	20	5.90	6.20	6.018	.367	.258	41.7	13.4	2.66	13.3	4.4	1.50	
6 x 6	15.5	4.62	6.00	6.000	.269	.240	30.3	10.1	2.56	9.69	3.2	1.45	
<b>B 5</b>	18.5	5.45	5.12	5.025	.420	.265	25.4	9.94	2.16	8.89	3.54	1.28	
5" WF	16	4.70	5.00	5.000	.360	.240	21.3	8.53	2.13	7.51	3.00	1.26	
5 x 5													

† These shapes have flange slope of 2 pct, and flange thicknesses shown are average thicknesses.  
All other sections shown on this page have parallel-faced flanges.

# BETHLEHEM LIGHT BEAMS LIGHT COLUMNS



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	W'						
			d'	b'	t'	t''		T	T'			
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	per cent
†B 12L	22	12 1/4	4	3/8	7/16	1/4	10 3/4	7/8	13	.30	2.0	
12" BL	19	12 1/8	4	5/16	3/8	1/4	10 3/4	13/16	12 1/4	.30	2.0	
12 x 4	16 1/2	12	4	1/4	5/16	1/4	10 3/4	13/16	12 5/8	.30	2.0	
†B 10L	19	10 1/4	4	3/8	7/16	1/4	8 7/8	13/16	11	.30	2.0	
10" BL	17	10 1/8	4	5/16	3/8	1/4	8 7/8	13/16	10 7/8	.30	2.0	
10 x 4	15	10	4	1/4	5/16	1/4	8 7/8	13/16	10 1/4	.30	2.0	
†B 8L	15	8 1/8	4	5/16	5/16	1/4	6 7/8	13/16	9	.30	2.0	
8" BL	13	8	4	1/4	1/4	1/4	6 7/8	13/16	9	.30	2.0	
8 x 4												
†B 6L	16	6 1/4	4	3/8	7/16	1/4	4 7/8	3/4	7 3/8	.25	2.0	
6" BL	12	6	4	1/4	5/16	1/4	4 7/8	3/4	7 1/4	.25	2.0	
6 x 4												
B 6	25	6 3/8	6	1/2	1/2	5/16	4 7/8	15/16	8 7/8	.30	0	
6" WF	20	6 1/4	6	3/8	3/8	1/4	4 7/8	7/8	8 5/8	.30	0	
6 x 6	15.5	6	6	1/4	1/4	1/4	4 7/8	13/16	8 1/2	.30	0	
B 5	18.5	5 1/8	5	7/16	7/16	1/4	3 11/16	7/8	7 1/8	.30	0	
5" WF	16	5	5	3/8	3/8	1/4	3 11/16	13/16	7	.30	0	
5 x 5												

† These shapes have flange slope of 2 pct.

All other sections shown on this page have parallel-faced flanges.

WF&BL

BJ&BS

STD

STD

ANGLES

PILING

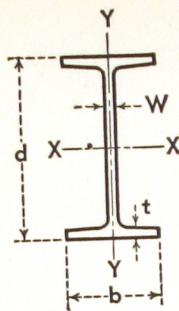
TEES

CAR & SHIP

BULB

CAR

ZEES



# BETHLEHEM JOISTS and STANCHIONS

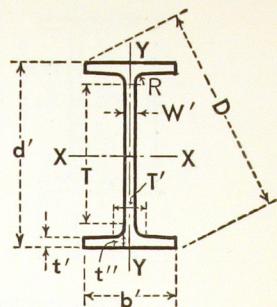
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y			
				A	d	Width in.	Thickness in.	W in.	I in. <sup>4</sup>	S in. <sup>3</sup>	r in.	I' in. <sup>4</sup>	S' in. <sup>3</sup>	r' in.
	lb	in. <sup>2</sup>	in.											
†BJ 12 12" BJ 12 x 4	14	4.14	11.91			3.970	.224	.200	88.2	14.8	4.61	2.25	1.13	.74
†BJ 10 10" BJ 10 x 4	11½	3.39	9.87			3.950	.204	.180	51.9	10.5	3.92	2.01	1.02	.77
†BJ 8 8" BJ 8 x 4	10	2.95	7.90			3.940	.204	.170	30.8	7.79	3.23	1.99	1.01	.82
†BJ 6 6" BJ 6 x 4	8½	2.50	5.83			3.940	.194	.170	14.8	5.07	2.43	1.89	.96	.87
BS 5 5" BS 5 x 5	18.9	5.47	5.00			5.000	.417	.313	23.8	9.5	2.08	7.80	3.10	1.20
†BS 4 4" BS 4 x 4	13	3.82	4.16			4.060	.345	.280	11.3	5.45	1.72	3.76	1.85	.99

† These shapes have flange slope of 2 pct, and flange thicknesses shown are average thicknesses.

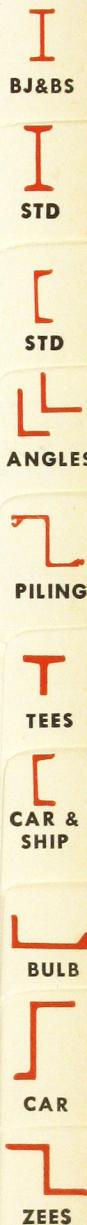
# BETHLEHEM JOISTS and STANCHIONS

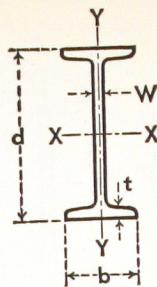
*Approximate Dimensions for Detailing*



Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange			Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Slope Inside Flange
			d'	b'	t'						
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
†BJ 12 12" BJ 12 x 4	14	11 $\frac{7}{8}$	4	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{16}$	10 $\frac{3}{4}$	1 $\frac{3}{16}$	12 $\frac{1}{2}$	.30	2.0
†BJ 10 10" BJ 10 x 4	11 $\frac{1}{2}$	9 $\frac{7}{8}$	4	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{16}$	8 $\frac{7}{8}$	$\frac{3}{4}$	10 $\frac{5}{8}$	.30	2.0
†BJ 8 8" BJ 8 x 4	10	7 $\frac{7}{8}$	4	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{16}$	6 $\frac{7}{8}$	$\frac{3}{4}$	8 $\frac{7}{8}$	.30	2.0
†BJ 6 6" BJ 6 x 4	8 $\frac{1}{2}$	5 $\frac{7}{8}$	4	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{16}$	5	1 $\frac{1}{16}$	7	.25	2.0
BS 5 5" BS 5 x 5	18.9	5	5	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{5}{16}$	3 $\frac{3}{8}$	$\frac{7}{8}$	7 $\frac{1}{8}$	.313	7.4
†BS 4 4" BS 4 x 4	13	4 $\frac{1}{8}$	4	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{5}{16}$	2 $\frac{7}{8}$	$\frac{3}{4}$	5 $\frac{7}{8}$	.25	2.0

† These shapes have flange slope of 2 pct.





# BEAMS

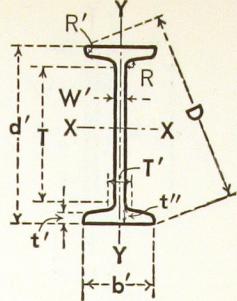
## American Standard

*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange		Web Thickness W	AXIS X-X			AXIS Y-Y		
				Width A	Average Thickness d		in.	in.	in.	in.	in.	in.
				lb	in. <sup>2</sup>		in.	in.	in.	in.	in.	in.
<b>I 24A</b> 24" Ia 24 x 7 $\frac{1}{8}$	120.0 105.9	35.13 30.98	24.00 24.00	8.048 7.875	1.102 1.102	.798 .625	3010.8 2811.5	250.9 234.3	9.26 9.53	84.9 78.9	21.1 20.0	1.56 1.60
<b>I 24</b> 24" I 24 x 7	100.0 90.0 79.9	29.25 26.30 23.33	24.00 24.00 24.00	7.247 7.124 7.000	.871 .871 .871	.747 .624 .500	2371.8 2230.1 2087.2	197.6 185.8 173.9	9.05 9.21 9.46	48.4 45.5 42.9	13.4 12.8 12.2	1.29 1.32 1.36
<b>I 20A</b> 20" Ia 20 x 7	95.0 85.0	27.74 24.80	20.00 20.00	7.200 7.053	.916 .916	.800 .653	1599.7 1501.7	160.0 150.2	7.59 7.78	50.5 47.0	14.0 13.3	1.35 1.38
<b>I 20</b> 20" I 20 x 6 $\frac{1}{4}$	75.0 65.4	21.90 19.08	20.00 20.00	6.391 6.250	.789 .789	.641 .500	1263.5 1169.5	126.3 116.9	7.60 7.83	30.1 27.9	9.4 8.9	1.17 1.21
<b>I 18</b> 18" I 18 x 6	70.0 54.7	20.46 15.94	18.00 18.00	6.251 6.000	.691 .691	.711 .460	917.5 795.5	101.9 88.4	6.70 7.07	24.5 21.2	7.8 7.1	1.09 1.15
<b>I 15</b> 15" I 15 x 5 $\frac{1}{2}$	50.0 42.9	14.59 12.49	15.00 15.00	5.640 5.500	.622 .622	.550 .410	481.1 441.8	64.2 58.9	5.74 5.95	16.0 14.6	5.7 5.3	1.05 1.08

# BEAMS

## American Standard



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange			Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Rounding (Toe)	Slope Inside Flange
			d'	b'	t'							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
I 24A 24" Ia 24 x 7 $\frac{1}{8}$	120 105.9	24 24	8 7 $\frac{1}{8}$	1 $\frac{3}{16}$ 1 $\frac{3}{16}$	1 $\frac{3}{8}$ 1 $\frac{3}{8}$	1 $\frac{3}{16}$ 5 $\frac{1}{8}$	20 $\frac{1}{8}$ 20 $\frac{1}{8}$	1 $\frac{13}{16}$ 1 $\frac{5}{8}$	25 $\frac{3}{8}$ 25 $\frac{1}{4}$	.60 .60	.30 .30	16 $\frac{3}{8}$ 16 $\frac{3}{8}$
I 24 24" I 24 x 7	100 90 79.9	24 24 24	7 $\frac{1}{4}$ 7 $\frac{1}{8}$ 7	5 $\frac{1}{8}$ 5 $\frac{1}{8}$ 5 $\frac{1}{8}$	1 $\frac{1}{8}$ 1 $\frac{1}{8}$ 1 $\frac{1}{8}$	3/4 5/8 1/2	20 $\frac{3}{4}$ 20 $\frac{3}{4}$ 20 $\frac{3}{4}$	1 $\frac{1}{4}$ 1 $\frac{5}{8}$ 1 $\frac{1}{2}$	25 $\frac{1}{8}$ 25 25	.60 .60 .60	.30 .30 .30	16 $\frac{3}{8}$ 16 $\frac{3}{8}$ 16 $\frac{3}{8}$
I 20A 20" Ia 20 x 7	95 85	20 20	7 $\frac{1}{4}$ 7	5 $\frac{1}{8}$ 5 $\frac{1}{8}$	1 $\frac{3}{16}$ 1 $\frac{3}{16}$	1 $\frac{3}{16}$ 1 $\frac{1}{16}$	16 $\frac{1}{2}$ 16 $\frac{1}{2}$	2 1 $\frac{13}{16}$	21 $\frac{1}{4}$ 21 $\frac{1}{4}$	.70 .70	.36 .36	16 $\frac{3}{8}$ 16 $\frac{3}{8}$
I 20 20" I 20 x 6 $\frac{1}{4}$	75 65.4	20	6 $\frac{3}{8}$ 6 $\frac{1}{4}$	9 $\frac{1}{16}$ 9 $\frac{1}{16}$	1 1	5/8 1/2	16 $\frac{7}{8}$ 16 $\frac{7}{8}$	1 $\frac{5}{8}$ 1 $\frac{1}{2}$	21 21	.60 .60	.30 .30	16 $\frac{3}{8}$ 16 $\frac{3}{8}$
I 18 18" I 18 x 6	70 54.7	18	6 $\frac{1}{4}$ 6	7 $\frac{1}{16}$ 7 $\frac{1}{16}$	1 $\frac{5}{16}$ 1 $\frac{5}{16}$	3/4 1/2	15 $\frac{1}{4}$ 15 $\frac{1}{4}$	1 $\frac{5}{8}$ 1 $\frac{3}{8}$	19 19	.56 .56	.28 .28	16 $\frac{3}{8}$ 16 $\frac{3}{8}$
I 15 15" I 15 x 5 $\frac{1}{2}$	50 42.9	15	5 $\frac{5}{8}$ 5 $\frac{1}{2}$	7 $\frac{1}{16}$ 7 $\frac{1}{16}$	1 $\frac{3}{16}$ 1 $\frac{3}{16}$	9 $\frac{1}{16}$ 7 $\frac{1}{16}$	12 $\frac{1}{2}$ 12 $\frac{1}{2}$	1 $\frac{3}{8}$ 1 $\frac{1}{4}$	16 16	.51 .51	.25 .25	16 $\frac{3}{8}$ 16 $\frac{3}{8}$



ANGLES



PILING



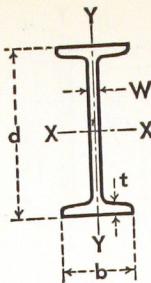
CAR & SHIP



CAR



ZEES



# BEAMS

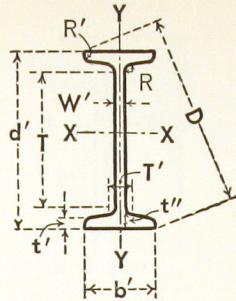
## American Standard

*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y			
				Width	Average Thickness	W		I	S	r	I'	S'	r'	
				b	t			in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	
lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
<b>I 12A</b> 12" Ia 12 x 5 $\frac{1}{4}$	50.0 40.8	14.57 11.84	12.00	5.477 5.250	.659 .659	.687 .460	301.6 268.9	50.3 44.8	4.55 4.77	16.0 13.8	5.8 5.3	1.05 1.08		
<b>I 12</b> 12" I 12 x 5	35.0 31.8	10.20 9.26	12.00	5.078 5.000	.544 .544	.428 .350	227.0 215.8	37.8 36.0	4.72 4.83	10.0 9.5	3.9 3.8	.99 1.01		
<b>I 10</b> 10" I 10 x 4 $\frac{5}{8}$	35.0 25.4	10.22 7.38	10.00	4.944 4.660	.491 .491	.594 .310	145.8 122.1	29.2 24.4	3.78 4.07	8.5 6.9	3.4 3.0	.91 .97		
<b>I 8</b> 8" I 8 x 4	23.0 18.4	6.71 5.34	8.00	4.171 4.000	.425 .425	.441 .270	64.2 56.9	16.0 14.2	3.09 3.26	4.4 3.8	2.1 1.9	.81 .84		
<b>I 7</b> 7" I 7 x 3 $\frac{5}{8}$	20.0 15.3	5.83 4.43	7.00	3.860 3.660	.392 .392	.450 .250	41.9 36.2	12.0 10.4	2.68 2.86	3.1 2.7	1.6 1.5	.74 .78		
<b>I 6</b> 6" I 6 x 3 $\frac{3}{8}$	17.25 12.5	5.02 3.61	6.00	3.565 3.330	.359 .359	.465 .230	26.0 21.8	8.7 7.3	2.28 2.46	2.3 1.8	1.3 1.1	.68 .72		
<b>I 5</b> 5" I 5 x 3	14.75 10.0	4.29 2.87	5.00	3.284 3.000	.326 .326	.494 .210	15.0 12.1	6.0 4.8	1.87 2.05	1.7 1.2	1.0 .82	.63 .65		
<b>I 4</b> 4" I 4 x 2 $\frac{5}{8}$	9.5 7.7	2.76 2.21	4.00	2.796 2.660	.293 .293	.326 .190	6.7 6.0	3.3 3.0	1.56 1.64	.91 .77	.65 .58	.58 .59		
<b>I 3</b> 3" I 3 x 2 $\frac{3}{8}$	7.5 5.7	2.17 1.64	3.00	2.509 2.330	.260 .260	.349 .170	2.9 2.5	1.9 1.7	1.15 1.23	.59 .46	.47 .40	.52 .53		

# BEAMS

## American Standard



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Rounding (Toe)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	W'							
			d'	b'	t'	t''							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
<b>I 12A</b>	50	12	5½	7/16	7/8	1 1/16	9 3/8	1 5/8	13 1/4	.56	.28	16 2/3	
12" Ia	40.8	12	5 1/4	7/16	7/8	1/2	9 3/8	1 1/8	13 1/8	.56	.28	16 2/3	
12 x 5 1/4													
<b>I 12</b>	35	12	5 1/8	3/8	3/4	7/16	9 3/4	1 1/16	13	.45	.21	16 2/3	
12" I	31.8	12	5	3/8	3/4	3/8	9 3/4	1 1/8	13	.45	.21	16 2/3	
12 x 5													
<b>I 10</b>	35	10	5	5/16	1 1/16	5/8	8	1 1/4	11 1/8	.41	.19	16 2/3	
10" I	25.4	10	4 5/8	5/16	1 1/16	5/16	8	1	11	.41	.19	16 2/3	
10 x 4 5/8													
<b>I 8</b>	23	8	4 1/8	1/4	9/16	7/16	6 1/4	1 1/16	9	.37	.16	16 2/3	
8" I	18.4	8	4	1/4	9/16	5/16	6 1/4	7/8	9	.37	.16	16 2/3	
8 x 4													
<b>I 7</b>	20	7	3 7/8	1/4	9/16	7/16	5 3/8	1 1/16	8	.35	.15	16 2/3	
7" I	15.3	7	3 5/8	1/4	9/16	1/4	5 3/8	1 9/16	7 7/8	.35	.15	16 2/3	
7 x 3 5/8													
<b>I 6</b>	17.25	6	3 5/8	1/4	1/2	1/2	4 1/2	1	7	.33	.14	16 2/3	
6" I	12.5	6	3 3/8	1/4	1/2	1/4	4 1/2	1 3/16	6 7/8	.33	.14	16 2/3	
6 x 3 3/8													
<b>I 5</b>	14.75	5	3 1/4	3/16	7/16	1/2	3 5/8	1	6	.31	.13	16 2/3	
5" I	10	5	3	3/16	7/16	1/4	3 5/8	3/4	5 7/8	.31	.13	16 2/3	
5 x 3													
<b>I 4</b>	9.5	4	2 3/4	3/16	3/8	5/16	2 3/4	1 3/16	4 7/8	.29	.11	16 2/3	
4" I	7.7	4	2 5/8	3/16	3/8	3/16	2 3/4	1 1/16	4 3/4	.29	.11	16 2/3	
4 x 2 5/8													
<b>I 3</b>	7.5	3	2 1/2	3/16	3/8	3/8	1 7/8	1 3/16	3 7/8	.27	.10	16 2/3	
3" I	5.7	3	2 9/8	3/16	3/8	3/16	1 7/8	5/8	3 3/4	.27	.10	16 2/3	
3 x 2 9/8													

STD

ANGLES

PILING

TEES

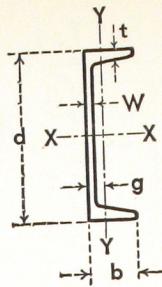
CAR & SHIP

BULB

CAR

ZEES

INDEX



# CHANNELS

## American Standard

*Theoretical Dimensions and Properties for Designing*

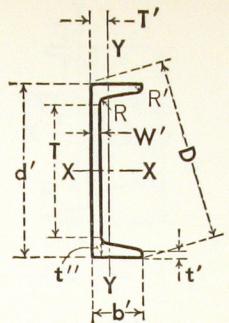
Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y			
				Width	Average Thickness	W		I	S	r	I'	S'	r'	g
				A	in. <sup>2</sup>	in.		in.	in.	in.	in.	in.	in.	in.
*SC 18 18" SC 18 x 4	58.0 51.9 45.8 42.7	16.98 15.18 13.38 12.48	18.00 18.00 18.00 18.00	4.200 4.100 4.000 3.950	.625 .625 .625 .625	.700 .600 .500 .450	670.7 622.1 573.5 549.2	74.5 69.1 63.7 61.0	6.29 6.40 6.55 6.64	18.5 17.1 15.8 15.0	5.6 5.3 5.1 4.9	1.04 1.06 1.09 1.10	.88 .87 .89 .90	
								in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	
C 15 15" L 15 x 3 $\frac{3}{8}$	50.0 40.0 33.9	14.64 11.70 9.90	15.00 15.00 15.00	3.716 3.520 3.400	.650 .650 .650	.716 .520 .400	401.4 346.3 312.6	53.6 46.2 41.7	5.24 5.44 5.62	11.2 9.3 8.2	3.8 3.4 3.2	.87 .89 .91	.80 .78 .79	
C 12 12" L 12 x 3	30.0 25.0 20.7	8.79 7.32 6.03	12.00 12.00 12.00	3.170 3.047 2.940	.501 .501 .501	.510 .387 .280	161.2 143.5 128.1	26.9 23.9 21.4	4.28 4.43 4.61	5.2 4.5 3.9	2.1 1.9 1.7	.77 .79 .81	.68 .68 .70	
C 10 10" L 10 x 2 $\frac{5}{8}$	30.0 25.0 20.0 15.3	8.80 7.33 5.86 4.47	10.00 10.00 10.00 10.00	3.033 2.886 2.739 2.600	.436 .436 .436 .436	.673 .526 .379 .240	103.0 90.7 78.5 66.9	20.6 18.1 15.7 13.4	3.42 3.52 3.66 3.87	4.0 3.4 2.8 2.3	1.7 1.5 1.3 1.2	.67 .68 .70 .72	.65 .66 .61 .64	
C 9 9" L 9 x 2 $\frac{1}{2}$	20.0 15.0 13.4	5.86 4.39 3.89	9.00 9.00 9.00	2.648 2.485 2.430	.413 .413 .413	.448 .285 .230	60.6 50.7 47.3	13.5 11.3 10.5	3.22 3.40 3.49	2.4 1.9 1.8	1.2 1.0 .97	.65 .67 .67	.59 .59 .61	

\* Car and shipbuilding channel; not an American standard.

# CHANNELS

## American Standard

Approximate Dimensions for Detailing



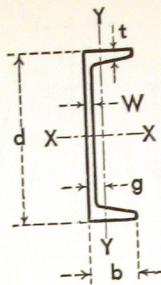
Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Rounding (Toe)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	Web Thickness (Nominal)						
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	pct
<b>*SC 18</b>	58	18	4 $\frac{1}{4}$	$\frac{9}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	15 $\frac{1}{8}$	15 $\frac{1}{16}$	18 $\frac{1}{2}$	.625	.425	3.5
18" SC	51.9	18	4 $\frac{1}{8}$	$\frac{9}{16}$	1 $\frac{1}{16}$	$\frac{5}{8}$	15 $\frac{1}{8}$	13 $\frac{1}{16}$	18 $\frac{1}{2}$	.625	.425	3.5
18 x 4	45.8	18	4	$\frac{9}{16}$	1 $\frac{1}{16}$	$\frac{1}{2}$	15 $\frac{1}{8}$	1 $\frac{1}{8}$	18 $\frac{1}{2}$	.625	.425	3.5
	42.7	18	4	$\frac{9}{16}$	1 $\frac{1}{16}$	7 $\frac{1}{16}$	15 $\frac{1}{8}$	1 $\frac{1}{16}$	18 $\frac{1}{8}$	.625	.425	3.5
<b>C 15</b>	50	15	3 $\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{3}{4}$	12 $\frac{3}{8}$	1 $\frac{1}{8}$	15 $\frac{1}{2}$	.50	.24	16 $\frac{2}{3}$
15" L	40	15	3 $\frac{1}{2}$	$\frac{3}{8}$	$\frac{7}{8}$	$\frac{9}{16}$	12 $\frac{3}{8}$	1 $\frac{5}{16}$	15 $\frac{3}{8}$	.50	.24	16 $\frac{2}{3}$
15 x 3 $\frac{3}{8}$	33.9	15	3 $\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{8}$	7 $\frac{1}{16}$	12 $\frac{3}{8}$	1 $\frac{3}{16}$	15 $\frac{3}{8}$	.50	.24	16 $\frac{2}{3}$
<b>C 12</b>	30	12	3 $\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	9 $\frac{7}{8}$	1 $\frac{3}{16}$	12 $\frac{3}{8}$	.38	.17	16 $\frac{2}{3}$
12" L	25	12	3	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{3}{8}$	9 $\frac{7}{8}$	1 $\frac{1}{16}$	12 $\frac{3}{8}$	.38	.17	16 $\frac{2}{3}$
12 x 3	20.7	12	3	$\frac{1}{4}$	$\frac{3}{4}$	5 $\frac{1}{16}$	9 $\frac{7}{8}$	5 $\frac{1}{8}$	12 $\frac{3}{8}$	.38	.17	16 $\frac{2}{3}$
<b>C 10</b>	30	10	3	$\frac{1}{4}$	$\frac{5}{8}$	1 $\frac{1}{16}$	8 $\frac{1}{8}$	1 $\frac{5}{16}$	10 $\frac{3}{8}$	.34	.14	16 $\frac{2}{3}$
10" L	25	10	2 $\frac{7}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	8 $\frac{1}{8}$	1 $\frac{3}{16}$	10 $\frac{3}{8}$	.34	.14	16 $\frac{2}{3}$
10 x 2 $\frac{5}{8}$	20	10	2 $\frac{3}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	8 $\frac{1}{8}$	1 $\frac{1}{16}$	10 $\frac{3}{8}$	.34	.14	16 $\frac{2}{3}$
	15.3	10	2 $\frac{5}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{1}{4}$	8 $\frac{1}{8}$	1 $\frac{1}{2}$	10 $\frac{3}{8}$	.34	.14	16 $\frac{2}{3}$
<b>C 9</b>	20	9	2 $\frac{5}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	7 $\frac{1}{16}$	7 $\frac{1}{4}$	$\frac{3}{4}$	9 $\frac{3}{8}$	.33	.14	16 $\frac{2}{3}$
9" L	15	9	2 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{8}$	5 $\frac{1}{16}$	7 $\frac{1}{4}$	$\frac{1}{16}$	9 $\frac{3}{8}$	.33	.14	16 $\frac{2}{3}$
9 x 2 $\frac{1}{2}$	13.4	9	2 $\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	1 $\frac{1}{4}$	7 $\frac{1}{4}$	$\frac{1}{2}$	9 $\frac{3}{8}$	.33	.14	16 $\frac{2}{3}$

\* Car and shipbuilding channel; not an American standard.

STD  
ANGLES  
PILEING

TEES  
CAR & SHIP

BULB  
CAR  
ZEEZ



# CHANNELS

## American Standard

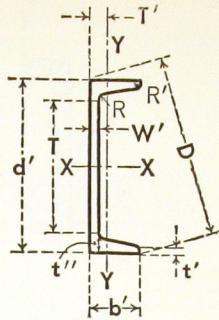
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thickness	AXIS X-X			AXIS Y-Y			
				Width	Average Thickness	W		I	S	r	I'	S'	r'	g
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>2</sup>	in.	in. <sup>4</sup>	in. <sup>2</sup>	in.	in.
<b>C 8</b> 8" L 8 x 2 1/4	18.75	5.49	8.00	2.527	.390	.487	43.7	10.9	2.82	2.0	1.0	.60	.57	
	13.75	4.02	8.00	2.343	.390	.303	35.8	9.0	2.99	1.5	.86	.62	.56	
	11.5	3.36	8.00	2.260	.390	.220	32.3	8.1	3.10	1.3	.79	.63	.58	
<b>C 7</b> 7" L 7 x 2 1/8	14.75	4.32	7.00	2.299	.366	.419	27.1	7.7	2.51	1.4	.79	.57	.53	
	12.25	3.58	7.00	2.194	.366	.314	24.1	6.9	2.59	1.2	.71	.58	.53	
	9.8	2.85	7.00	2.090	.366	.210	21.1	6.0	2.72	.98	.63	.59	.55	
<b>C 6</b> 6" L 6 x 2	13.0	3.81	6.00	2.157	.343	.437	17.3	5.8	2.13	1.1	.65	.53	.52	
	10.5	3.07	6.00	2.034	.343	.314	15.1	5.0	2.22	.87	.57	.53	.50	
	8.2	2.39	6.00	1.920	.343	.200	13.0	4.3	2.34	.70	.50	.54	.52	
<b>C 5</b> 5" L 5 x 1 3/4	9.0	2.63	5.00	1.885	.320	.325	8.8	3.5	1.83	.64	.45	.49	.48	
	6.7	1.95	5.00	1.750	.320	.190	7.4	3.0	1.95	.48	.38	.50	.49	
<b>C 4</b> 4" L 4 x 1 5/8	7.25	2.12	4.00	1.720	.296	.320	4.5	2.3	1.47	.44	.35	.46	.46	
	5.4	1.56	4.00	1.580	.296	.180	3.8	1.9	1.56	.32	.29	.45	.46	
<b>C 3</b> 3" L 3 x 1 1/2	6.0	1.75	3.00	1.596	.273	.356	2.1	1.4	1.08	.31	.27	.42	.46	
	5.0	1.46	3.00	1.498	.273	.258	1.8	1.2	1.12	.25	.24	.41	.44	
	4.1	1.19	3.00	1.410	.273	.170	1.6	1.1	1.17	.20	.21	.41	.44	

# CHANNELS

## American Standard

Approximate Dimensions for Detailing



Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Round- ing (Toe)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	W'							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	per cent
.57 C 8	18.75	8	2 1/2	1/4	9/16	1/2	6 3/8	3/4	8 3/8	.32	.13	.13	16 2/3
.56 8" L	13.75	8	2 3/8	1/4	9/16	5/16	6 3/8	9/16	8 3/8	.32	.13	.13	16 2/3
.58 8 x 2 1/4	11.5	8	2 1/4	1/4	9/16	1/4	6 3/8	1/2	8 3/8	.32	.13	.13	16 2/3
.53 C 7	14.75	7	2 1/4	3/16	1/2	7/16	5 3/8	1 1/16	7 3/8	.31	.13	.13	16 2/3
.53 7" L	12.25	7	2 1/4	3/16	1/2	5/16	5 3/8	9/16	7 3/8	.31	.13	.13	16 2/3
.55 7 x 2 1/8	9.8	7	2 1/8	3/16	1/2	1/4	5 3/8	1/2	7 1/4	.31	.13	.13	16 2/3
.52 C 6	13.0	6	2 1/8	3/16	1/2	7/16	4 1/2	1 1/16	6 3/8	.30	.12	.12	16 2/3
.50 6" L	10.5	6	2	3/16	1/2	5/16	4 1/2	9/16	6 3/8	.30	.12	.12	16 2/3
.52 6 x 2	8.2	6	1 1/8	3/16	1/2	3/16	4 1/2	7/16	6 1/4	.30	.12	.12	16 2/3
.48 C 5	9.0	5	1 1/8	3/16	7/16	5/16	3 5/8	9/16	5 3/8	.29	.11	.11	16 2/3
.49 5" L	6.7	5	1 3/4	3/16	7/16	3/16	3 5/8	7/16	5 1/4	.29	.11	.11	16 2/3
.46 C 4	7.25	4	1 3/4	3/16	7/16	5/16	2 3/4	9/16	4 3/8	.28	.11	.11	16 2/3
.46 4" L	5.4	4	1 5/8	3/16	7/16	3/16	2 3/4	7/16	4 1/4	.28	.11	.11	16 2/3
.46 C 3	6.0	3	1 5/8	3/16	3/8	3/8	1 3/4	9/16	3 3/8	.27	.10	.10	16 2/3
.44 3" L	5.0	3	1 1/2	3/16	3/8	1/4	1 3/4	1/2	3 3/8	.27	.10	.10	16 2/3
.44 3 x 1 1/2	4.1	3	1 1/8	3/16	3/8	3/16	1 3/4	3/8	3 3/8	.27	.10	.10	16 2/3

**L**  
ANGLES

**T**  
PILEING

**T**  
TEES

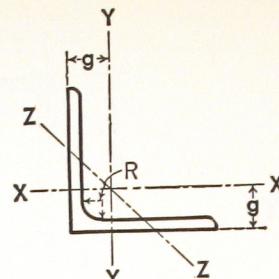
**C** &  
SHIP

**L**  
BULB

**C**  
CAR

**L**  
ZEEZ

INDEX



# ANGLES

## Equal Legs

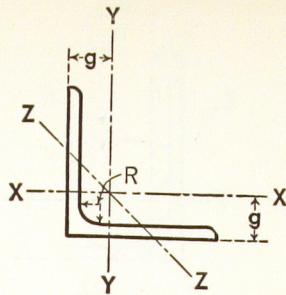
*Theoretical Dimensions and Properties for Designing*

Section Number and Size	Thickness	Weight per Foot	Area of Section	Radius of Fillet	AXIS X-X AND AXIS Y-Y				AXIS Z-Z
					I	S	r or r'	g	
					in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	
8 x 8 A 80	1 1/8	56.9	16.73	5/8	98.0	17.5	2.42	2.41	1.56
	1	51.0	15.00	5/8	89.0	15.8	2.44	2.37	1.56
	7/8	45.0	13.23	5/8	79.6	14.0	2.45	2.32	1.57
	3/4	38.9	11.44	5/8	69.7	12.2	2.47	2.28	1.57
	5/8	32.7	9.61	5/8	59.4	10.3	2.49	2.23	1.58
	9/16	29.6	8.68	5/8	54.1	9.3	2.50	2.21	1.58
	1/2	26.4	7.75	5/8	48.6	8.4	2.50	2.19	1.59
6 x 6 A 60	1	37.4	11.00	1/2	35.5	8.6	1.80	1.86	1.17
	7/8	33.1	9.73	1/2	31.9	7.6	1.81	1.82	1.17
	3/4	28.7	8.44	1/2	28.2	6.7	1.83	1.78	1.17
	5/8	24.2	7.11	1/2	24.2	5.7	1.84	1.73	1.18
	9/16	21.9	6.43	1/2	22.1	5.1	1.85	1.71	1.18
	1/2	19.6	5.75	1/2	19.9	4.6	1.86	1.68	1.18
	7/16	17.2	5.06	1/2	17.7	4.1	1.87	1.66	1.19
5 x 5 A 50	3/8	14.9	4.36	1/2	15.4	3.5	1.88	1.64	1.19
	7/8	27.2	7.98	1/2	17.8	5.2	1.49	1.57	.97
	3/4	23.6	6.94	1/2	15.7	4.5	1.51	1.52	.97
	5/8	20.0	5.86	1/2	13.6	3.9	1.52	1.48	.98
	1/2	16.2	4.75	1/2	11.3	3.2	1.54	1.43	.98
	7/16	14.3	4.18	1/2	10.0	2.8	1.55	1.41	.98
	3/8	12.3	3.61	1/2	8.7	2.4	1.56	1.39	.99
4 x 4 A 40	* 5/16	10.3	3.03	1/2	7.4	2.0	1.56	1.36	.99
	3/4	18.5	5.44	3/8	7.7	2.8	1.19	1.27	.78
	5/8	15.7	4.61	3/8	6.7	2.4	1.20	1.23	.78
	1/2	12.8	3.75	3/8	5.6	2.0	1.22	1.18	.78
	7/16	11.3	3.31	3/8	5.0	1.8	1.23	1.16	.78
	3/8	9.8	2.86	3/8	4.4	1.5	1.23	1.14	.79
	5/16	8.2	2.40	3/8	3.7	1.3	1.24	1.12	.79
		* 1/4	6.6	1.94	3/8	3.0	1.1	1.25	1.09

\* Special gauge, taking a special extra.

# ANGLES

## Equal Legs



*Theoretical Dimensions and Properties for Designing*

Section Number and Size	Thickness	Weight per Foot	Area of Section	Radius of Fillet	AXIS X-X AND AXIS Y-Y				AXIS Z-Z
					I	S	r or r'	g	
					in.	lb	in. <sup>2</sup>	in.	in.
A 35	1/2	11.1	3.25	3/8	3.6	1.5	1.06	1.06	.68
	7/16	9.8	2.87	3/8	3.3	1.3	1.07	1.04	.68
	5/8	8.5	2.48	3/8	2.9	1.2	1.07	1.01	.69
	5/16	7.2	2.09	3/8	2.5	.98	1.08	.99	.69
	1/4	5.8	1.69	3/8	2.0	.79	1.09	.97	.69
A 30	1/2	9.4	2.75	5/16	2.2	1.1	.90	.93	.58
	7/16	8.3	2.43	5/16	2.0	.95	.91	.91	.58
	3/8	7.2	2.11	5/16	1.8	.83	.91	.89	.58
	5/16	6.1	1.78	5/16	1.5	.71	.92	.87	.59
	1/4	4.9	1.44	5/16	1.2	.58	.93	.84	.59
	* 3/16	3.71	1.09	5/16	.96	.44	.94	.82	.59
A 25	1/2	7.7	2.25	1/4	1.2	.72	.74	.81	.49
	3/8	5.9	1.73	1/4	.98	.57	.75	.76	.49
	5/16	5.0	1.47	1/4	.85	.48	.76	.74	.49
	1/4	4.1	1.19	1/4	.70	.39	.77	.72	.49
	3/16	3.07	.90	1/4	.55	.30	.78	.69	.49
	1/2	4.7	1.36	3/16	.48	.35	.59	.64	.39
A 20	5/16	3.92	1.15	3/16	.42	.30	.60	.61	.39
	1/4	3.19	.94	3/16	.35	.25	.61	.59	.39
	3/16	2.44	.71	3/16	.27	.19	.62	.57	.39
	1/8	1.65	.48	3/16	.19	.13	.63	.55	.40
	1/4	2.77	.81	3/16	.23	.19	.53	.53	.34
A 17	3/16	2.12	.62	3/16	.18	.14	.54	.51	.34
	1/8	1.44	.42	3/16	.13	.10	.55	.48	.35
	1/8	1.44	.42	3/16	.13	.10	.55	.48	.35
A 15	1/4	2.34	.69	1/8	.14	.13	.45	.47	.29
	3/16	1.80	.53	1/8	.11	.10	.46	.44	.29
	1/8	1.23	.36	1/8	.08	.07	.47	.42	.30
A 12	1/4	1.92	.56	1/8	.08	.09	.37	.40	.24
	3/16	1.48	.43	1/8	.06	.07	.38	.38	.24
	1/8	1.01	.30	1/8	.04	.05	.38	.36	.25
A 100	1/4	1.49	.44	1/8	.04	.06	.29	.34	.20
	3/16	1.16	.34	1/8	.03	.04	.30	.32	.19
	1/8	.80	.23	1/8	.02	.03	.30	.30	.20

† These sections are in the bar classification, and are subject to bar extras.

\* Special gauge, taking a special extra.

ANGLES

PILING

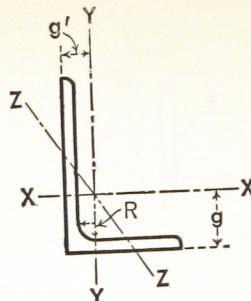
TEES

CAR & SHIP

BULB

CAR

ZEES



# ANGLES

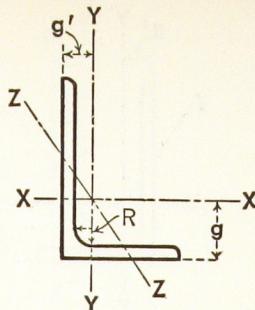
## Unequal Legs

*Theoretical Dimensions and Properties for Designing*

Section Number and Size	Thickness	Weight per Foot	Area of Section A	Radius of Fillet R	AXIS X-X				AXIS Y-Y				AXIS Z-Z
					I	S	r	g	I'	S'	r'	g'	
					in.	lb	in. <sup>2</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in.
<b>9 x 4</b> A 94	1	40.8	12.00	1/2	97.0	17.6	2.84	3.50	12.0	4.0	1.00	1.00	.83
	7/8	36.1	10.61	1/2	86.8	15.7	2.86	3.45	10.8	3.6	1.01	.95	.84
	3/4	31.3	9.19	1/2	76.1	13.6	2.88	3.41	9.6	3.1	1.02	.91	.84
	5/8	26.3	7.73	1/2	64.9	11.5	2.90	3.36	8.3	2.6	1.04	.86	.85
	9/16	23.8	7.00	1/2	59.1	10.4	2.91	3.33	7.6	2.4	1.04	.83	.85
	1/2	21.3	6.25	1/2	53.2	9.3	2.92	3.31	6.9	2.2	1.05	.81	.85
<b>8 x 6</b> A 86	1	44.2	13.00	1/2	80.8	15.1	2.49	2.65	38.8	8.9	1.73	1.65	1.28
	7/8	39.1	11.48	1/2	72.3	13.4	2.51	2.61	34.9	7.9	1.74	1.61	1.28
	3/4	33.8	9.94	1/2	63.4	11.7	2.53	2.56	30.7	6.9	1.76	1.56	1.29
	5/8	28.5	8.36	1/2	54.1	9.9	2.54	2.52	26.3	5.9	1.77	1.52	1.29
	9/16	25.7	7.56	1/2	49.3	9.0	2.55	2.50	24.0	5.3	1.78	1.50	1.30
	1/2	23.0	6.75	1/2	44.3	8.0	2.56	2.47	21.7	4.8	1.79	1.47	1.30
	7/16	20.2	5.93	1/2	39.2	7.1	2.57	2.45	19.3	4.2	1.80	1.45	1.31
<b>8 x 4</b> A 84	1	37.4	11.00	1/2	69.6	14.1	2.52	3.05	11.6	3.9	1.03	1.05	.85
	7/8	33.1	9.73	1/2	62.5	12.5	2.53	3.00	10.5	3.5	1.04	1.00	.85
	3/4	28.7	8.44	1/2	54.9	10.9	2.55	2.95	9.4	3.1	1.05	.95	.85
	5/8	24.2	7.11	1/2	46.9	9.2	2.57	2.91	8.1	2.6	1.07	.91	.86
	9/16	21.9	6.43	1/2	42.8	8.4	2.58	2.88	7.4	2.4	1.07	.88	.86
	1/2	19.6	5.75	1/2	38.5	7.5	2.59	2.86	6.7	2.2	1.08	.86	.86
	7/16	17.2	5.06	1/2	34.1	6.6	2.60	2.83	6.0	1.9	1.09	.83	.87
<b>7 x 4</b> A 74	7/8	30.2	8.86	1/2	42.9	9.7	2.20	2.55	10.2	3.5	1.07	1.05	.86
	3/4	26.2	7.69	1/2	37.8	8.4	2.22	2.51	9.1	3.0	1.09	1.01	.86
	5/8	22.1	6.48	1/2	32.4	7.1	2.24	2.46	7.8	2.6	1.10	.96	.86
	9/16	20.0	5.87	1/2	29.6	6.5	2.24	2.44	7.2	2.4	1.11	.94	.87
	1/2	17.9	5.25	1/2	26.7	5.8	2.25	2.42	6.5	2.1	1.11	.92	.87
	7/16	15.8	4.62	1/2	23.7	5.1	2.26	2.39	5.8	1.9	1.12	.89	.88
	3/8	13.6	3.98	1/2	20.6	4.4	2.27	2.37	5.1	1.6	1.13	.87	.88

# ANGLES

## Unequal Legs



*Theoretical Dimensions and Properties for Designing*

Section Number and Size	Thickness	Weight per Foot	Area of Section A	Radius of Fillet R	AXIS X-X				AXIS Y-Y				AXIS Z-Z
					I	S	r	g	I'	S'	r'	g'	
					in.	lb	in. <sup>2</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in.
6 x 4 A 64	7/8	27.2	7.98	1/2	27.7	7.2	1.86	2.12	9.8	3.4	1.11	1.12	.86
	3/4	23.6	6.94	1/2	24.5	6.3	1.88	2.08	8.7	3.0	1.12	1.08	.86
	5/8	20.0	5.86	1/2	21.1	5.3	1.90	2.03	7.5	2.5	1.13	1.03	.86
	9/16	18.1	5.31	1/2	19.3	4.8	1.90	2.01	6.9	2.3	1.14	1.01	.87
	1/2	16.2	4.75	1/2	17.4	4.3	1.91	1.99	6.3	2.1	1.15	.99	.87
	7/16	14.3	4.18	1/2	15.5	3.8	1.92	1.96	5.6	1.9	1.16	.96	.87
	3/8	12.3	3.61	1/2	13.5	3.3	1.93	1.94	4.9	1.6	1.17	.94	.88
	* 5/16	10.3	3.03	1/2	11.4	2.8	1.94	1.92	4.2	1.4	1.17	.92	.88
6 x 3 1/2 A 63	1/2	15.3	4.50	1/2	16.6	4.2	1.92	2.08	4.2	1.6	.97	.83	.76
	3/8	11.7	3.42	1/2	12.9	3.2	1.94	2.04	3.3	1.2	.99	.79	.77
	* 5/16	9.8	2.87	1/2	10.9	2.7	1.95	2.01	2.8	1.0	1.00	.76	.77
5 x 3 1/2 A 54	3/4	19.8	5.81	7/16	13.9	4.3	1.55	1.75	5.6	2.2	.98	1.00	.75
	5/8	16.8	4.92	7/16	12.0	3.7	1.56	1.70	4.8	1.9	.99	.95	.75
	1/2	13.6	4.00	7/16	10.0	3.0	1.58	1.66	4.1	1.6	1.01	.91	.75
	7/16	12.0	3.53	7/16	8.9	2.6	1.59	1.63	3.6	1.4	1.01	.88	.76
	3/8	10.4	3.05	7/16	7.8	2.3	1.60	1.61	3.2	1.2	1.02	.86	.76
	5/16	8.7	2.56	7/16	6.6	1.9	1.61	1.59	2.7	1.0	1.03	.84	.77
	* 1/4	7.0	2.06	7/16	5.4	1.6	1.61	1.56	2.2	.83	1.04	.81	.77
5 x 3 A 53	1/2	12.8	3.75	3/8	9.4	2.9	1.59	1.75	2.6	1.1	.83	.75	.65
	3/8	9.8	2.86	3/8	7.4	2.2	1.61	1.70	2.0	.89	.84	.70	.65
	5/16	8.2	2.40	3/8	6.3	1.9	1.61	1.68	1.7	.75	.85	.68	.66
	* 1/4	6.6	1.94	3/8	5.1	1.5	1.62	1.66	1.4	.61	.86	.66	.66

\* Special gauge, taking a special extra.

 PILING

 TEES

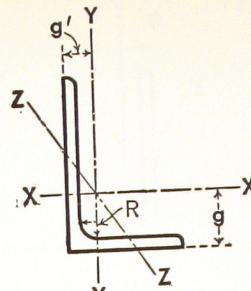
 CAR & SHIP

 BULB

 CAR

 ZEES

INDEX



# ANGLES

## Unequal Legs

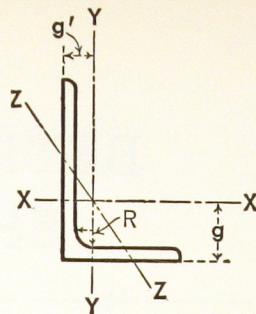
*Theoretical Dimensions and Properties for Designing*

Section Number and Size	Thickness	Weight per Foot	Area of Section A	Radius of Fillet R	AXIS X-X				AXIS Y-Y				AXIS Z-Z
					I	S	r	g	I'	S'	r'	g'	r''
					in.	lb	in. <sup>2</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in.
4 x 3 1/2 A 44	5/8	14.7	4.30	5/8	6.4	2.4	1.22	1.29	4.5	1.8	1.03	1.04	.72
	1/2	11.9	3.50	5/8	5.3	1.9	1.23	1.25	3.8	1.5	1.04	1.00	.72
	7/16	10.6	3.09	5/8	4.8	1.7	1.24	1.23	3.4	1.4	1.05	.98	.72
	3/8	9.1	2.67	5/8	4.2	1.5	1.25	1.21	3.0	1.2	1.06	.96	.73
	5/16	7.7	2.25	5/8	3.6	1.3	1.26	1.18	2.6	1.0	1.07	.93	.73
	* 1/4	6.2	1.81	5/8	2.9	1.0	1.27	1.16	2.1	.81	1.07	.91	.73
4 x 3 A 43	5/8	13.6	3.98	5/8	6.0	2.3	1.23	1.37	2.9	1.4	.85	.87	.64
	1/2	11.1	3.25	5/8	5.1	1.9	1.25	1.33	2.4	1.1	.86	.83	.64
	7/16	9.8	2.87	5/8	4.5	1.7	1.25	1.30	2.2	1.0	.87	.80	.64
	3/8	8.5	2.48	5/8	4.0	1.5	1.26	1.28	1.9	.87	.88	.78	.64
	5/16	7.2	2.09	5/8	3.4	1.2	1.27	1.26	1.7	.73	.89	.76	.65
	* 1/4	5.8	1.69	5/8	2.8	1.0	1.28	1.24	1.4	.60	.90	.74	.65
3 1/2 x 3 A 38	1/2	10.2	3.00	5/8	3.5	1.5	1.07	1.13	2.3	1.1	.88	.88	.62
	7/16	9.1	2.65	5/8	3.1	1.3	1.08	1.10	2.1	.98	.89	.85	.62
	3/8	7.9	2.30	5/8	2.7	1.1	1.09	1.08	1.9	.85	.90	.83	.62
	5/16	6.6	1.93	5/8	2.3	.95	1.10	1.06	1.6	.72	.90	.81	.63
	1/4	5.4	1.56	5/8	1.9	.78	1.11	1.04	1.3	.59	.91	.79	.63
3 1/2 x 2 1/2 A 37	1/2	9.4	2.75	5/16	3.2	1.4	1.09	1.20	1.4	.76	.70	.70	.53
	7/16	8.3	2.43	5/16	2.9	1.3	1.09	1.18	1.2	.68	.71	.68	.54
	3/8	7.2	2.11	5/16	2.6	1.1	1.10	1.16	1.1	.59	.72	.66	.54
	5/16	6.1	1.78	5/16	2.2	.93	1.11	1.14	.94	.50	.73	.64	.54
	1/4	4.9	1.44	5/16	1.8	.75	1.12	1.11	.78	.41	.74	.61	.54

\* Special gauge, taking a special extra.

# ANGLES

## Unequal Legs



*Theoretical Dimensions and Properties for Designing*

Section Number and Size	Thickness	Weight per Foot	Area of Section	Radius of Fillet	AXIS X-X				AXIS Y-Y				AXIS Z-Z
					A		R		I	S	r	g	
					in.	lb	in. <sup>2</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	
3 x 2 1/2 A 33	1/2	8.5	2.50	5/16	2.1	1.0	.91	1.00	1.3	.74	.72	.75	.52
	7/16	7.6	2.21	5/16	1.9	.93	.92	.98	1.2	.66	.73	.73	.52
	5/8	6.6	1.92	5/16	1.7	.81	.93	.96	1.0	.58	.74	.71	.52
	5/16	5.6	1.62	5/16	1.4	.69	.94	.93	.90	.49	.74	.68	.53
	1/4	4.5	1.31	5/16	1.2	.56	.95	.91	.74	.40	.75	.66	.53
3 x 2 A 32	1/2	7.7	2.25	5/16	1.9	1.0	.92	1.08	.67	.47	.55	.58	.43
	7/16	6.8	2.00	5/16	1.7	.89	.93	1.06	.61	.42	.55	.56	.43
	5/8	5.9	1.73	5/16	1.5	.78	.94	1.04	.54	.37	.56	.54	.43
	5/16	5.0	1.47	5/16	1.3	.66	.95	1.02	.47	.32	.57	.52	.43
	1/4	4.1	1.19	5/16	1.1	.54	.96	.99	.39	.26	.57	.49	.43
2 1/2 x 2 †A 27	* 3/16	3.07	.90	5/16	.84	.41	.97	.97	.31	.20	.58	.47	.44
	5/8	5.3	1.55	1/4	.91	.55	.77	.83	.51	.36	.58	.58	.42
	5/16	4.5	1.31	1/4	.79	.47	.78	.81	.45	.31	.58	.56	.42
	1/4	3.62	1.06	1/4	.65	.38	.78	.79	.37	.25	.59	.54	.42
	3/16	2.75	.81	1/4	.51	.29	.79	.76	.29	.20	.60	.51	.43
2 1/2 x 1 1/2 †A 26	5/16	3.92	1.15	3/16	.71	.44	.79	.90	.19	.17	.41	.40	.32
	1/4	3.19	.94	3/16	.59	.36	.79	.88	.16	.14	.41	.38	.32
	3/16	2.44	.72	3/16	.46	.28	.80	.85	.13	.11	.42	.35	.33
2 x 1 1/2 †A 21	1/4	2.77	.81	3/16	.32	.24	.62	.66	.15	.14	.43	.41	.32
	3/16	2.12	.62	3/16	.25	.18	.63	.64	.12	.11	.44	.39	.32
	1/8	1.44	.42	3/16	.17	.13	.64	.62	.09	.08	.45	.37	.33
2 x 1 1/4 †A 23	1/4	2.55	.75	3/16	.30	.23	.63	.71	.09	.10	.34	.33	.27
	3/16	1.96	.57	3/16	.23	.18	.64	.69	.07	.08	.35	.31	.27
1 3/4 x 1 1/4 †A 16	1/4	2.34	.69	3/16	.20	.18	.54	.60	.09	.10	.35	.35	.27
	3/16	1.80	.53	3/16	.16	.14	.55	.58	.07	.08	.36	.33	.27
	1/8	1.23	.36	3/16	.11	.09	.56	.56	.05	.05	.37	.31	.27

\* Special gauge, taking a special extra.

† These sections are in the bar classification, and are subject to bar extras.

 PILING

 TEES

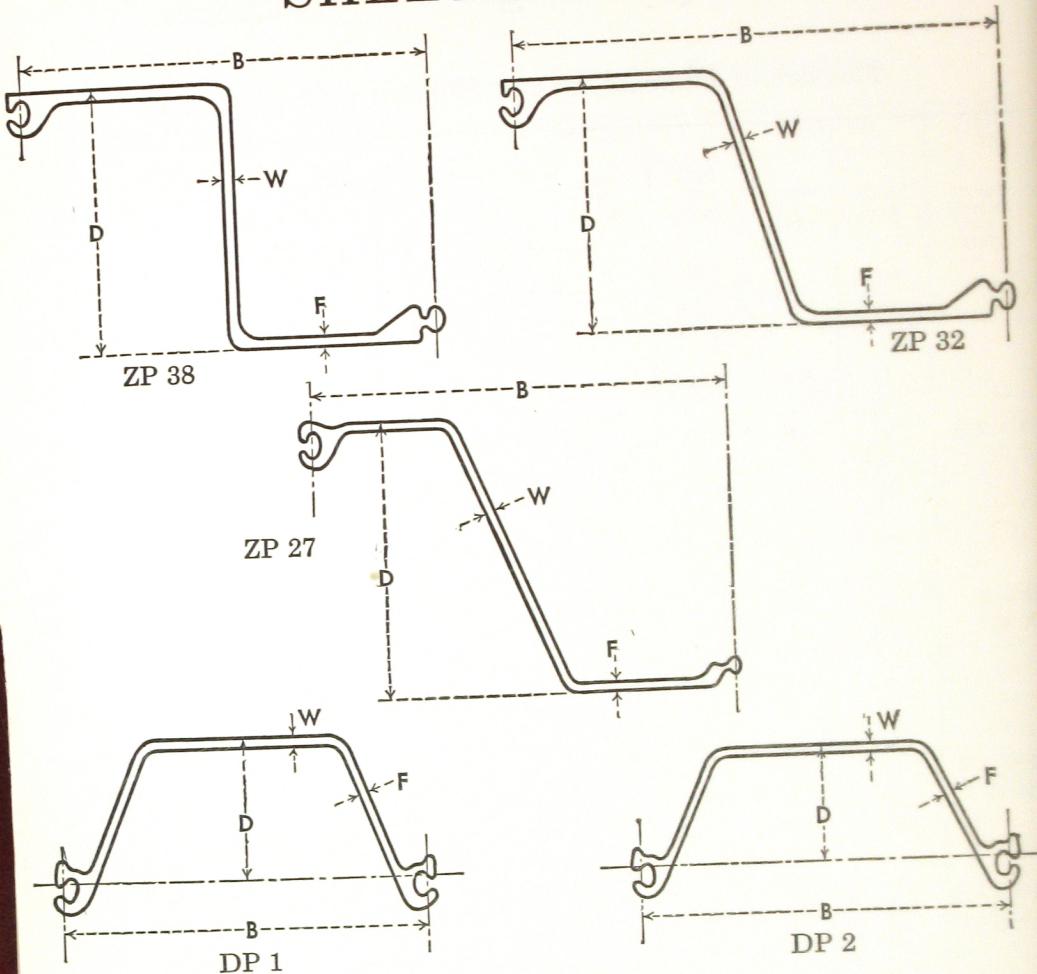
 CAR & SHIP

 BULB

 CAR

 ZEES

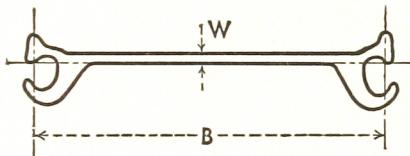
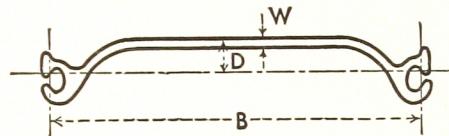
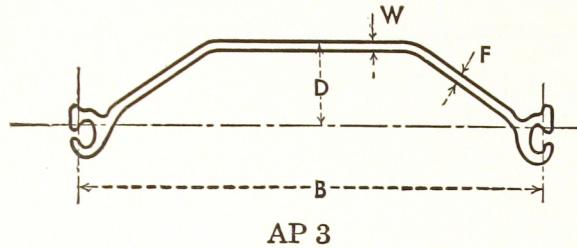
# BETHLEHEM STEEL SHEET PILING



*Dimensions and Properties*

Section Number	Nominal Width B in.	Web Thickness W in.	Flange Thickness F in.	Nominal Depth D in.	Single Section				Weight lb per sq ft	S in. <sup>3</sup>
					Weight per Foot lb	Area in. <sup>2</sup>	I in. <sup>4</sup>	S in. <sup>3</sup>		
<b>ZP 38</b>	18	$\frac{3}{8}$	$\frac{1}{2}$	12	57.0	16.77	421.2	70.2	38.0	46.8
<b>ZP 32</b>	21	$\frac{3}{8}$	$\frac{1}{2}$	$11\frac{1}{2}$	56.0	16.47	385.7	67.0	32.0	38.3
<b>ZP 27</b>	18	$\frac{3}{8}$	$\frac{3}{8}$	12	40.5	11.91	276.3	45.3	27.0	30.2
<b>DP 1</b>	16	$3\frac{1}{64}$	$\frac{3}{8}$	6	42.7	12.56	87.0	20.4	32.0	15.3
<b>DP 2</b>	16	$\frac{3}{8}$	$\frac{3}{8}$	5	36.0	10.59	53.0	14.3	27.0	10.7

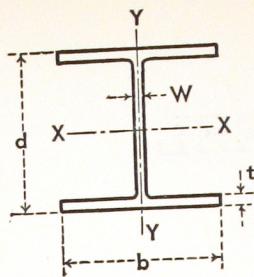
# BETHLEHEM STEEL SHEET PILING



L PILING  
 T TEES  
 C CAR & SHIP  
 B BULB  
 C CAR  
 Z ZEES

## Dimensions and Properties

Section Number	Nominal Width in.	Web Thick- ness in.	Flange Thick- ness in.	Nominal Depth in.	Single Section				Per Foot of Wall Weight lb per sq ft	S in. <sup>3</sup>
					Weight per Foot lb	Area in. <sup>2</sup>	I in. <sup>4</sup>	S in. <sup>3</sup>		
AP 3	19 $\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	3 $\frac{1}{2}$	36.0	10.59	26.0	8.8	22.0	5.4
SP 4	16	$\frac{3}{8}$	..	1 $\frac{11}{32}$	30.7	8.99	5.5	3.2	23.0	2.4
SP 5	16	$\frac{1}{2}$	..	1 $\frac{11}{32}$	37.3	10.98	6.0	3.3	28.0	2.5
SP 6a	15	$\frac{3}{8}$	..	..	35.0	10.29	4.6	3.0	28.0	2.4
SP 7a	15	$\frac{1}{2}$	..	..	40.0	11.76	4.6	3.0	32.0	2.4



# BETHLEHEM BEARING PILES

*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Section	Flange			Web Thick-ness	AXIS X-X			AXIS Y-Y			
				A	d	Width		W	I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
BP 14	117	34.44	14.234	14.885	.805	.805	1228.5	172.6	5.97	443.1	59.5	3.59		
	102	30.01	14.032	14.784	.704	.704	1055.1	150.4	5.93	379.6	51.3	3.56		
	14 x 14½	89	26.19	13.856	14.696	.616	.616	909.1	131.2	5.89	326.2	44.4	3.53	
		73	21.46	13.636	14.586	.506	.506	733.1	107.5	5.85	261.9	35.9	3.49	
BP 12	74	21.76	12.122	12.217	.607	.607	566.5	93.5	5.10	184.7	30.2	2.91		
	12 x 12	53	15.58	11.780	12.046	.436	.436	394.8	67.0	5.03	127.3	21.2	2.86	
BP 10	57	16.76	10.012	10.224	.564	.564	294.7	58.9	4.19	100.6	19.7	2.45		
	10 x 10	42	12.35	9.720	10.078	.418	.418	210.8	43.4	4.13	71.4	14.2	2.40	
BP 8	36	10.60	8.026	8.158	.446	.446	119.8	29.9	3.36	40.4	9.9	1.95		
	8 x 8													

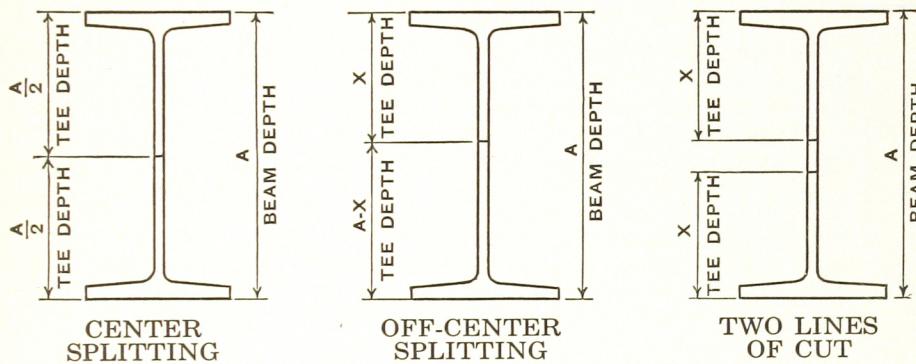
## STRUCTURAL TEES

## *Split from Wide-Flange Sections and Standard Beams*

Split tees are produced by shearing or flame-cutting either standard beams or wide-flange sections.

Generally, any beam or channel section from 3 in. to 36 in. in depth can be split to form tees or angles.

Orders should cover the full product of the beam or channel section prior to splitting.



The following tolerances, over or under, apply to the depth of the tee or angle:

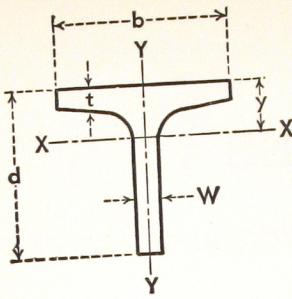
Beams or Channels up to 6 in., excl.	1/8 in.
Beams or Channels 6 in. to 16 in., excl.	3/16 in.
Beams or Channels 16 in. to 20 in., excl.	1/4 in.
Beams 20 in. to 24 in., excl.	5/16 in.
Beams 24 in. and over	3/8 in.

The above tolerances for depth of tees or angles include the allowable tolerances in depth for the beams or channels before splitting. Tolerances both for dimensions and straightness, as set up for the beams or channels from which these tees or angles are cut, will apply, except:

$$\text{Straightness} = \frac{1}{8} \text{ in.} \times \frac{\text{length, in ft}}{5 \text{ ft}}$$

Length: The length tolerances for split tees or angles are the same as those applicable to the section from which the tees or angles are split.



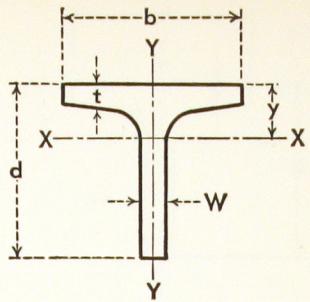


# BETHLEHEM STRUCTURAL TEES

*Theoretical Dimensions and Properties for Designing*

Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange			Stem Thickness	AXIS X-X				AXIS Y-Y			
				A	d	b	t	W	I	S	r	y	I'	S'	r'
									in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
BT 18A ST 18 WF	150	44.09	18.36	16.655	1.680	.945	1222.7	85.9	5.27	4.13	612.6	73.6	3.73		
	140	41.16	18.25	16.595	1.570	.885	1133.3	79.9	5.25	4.07	563.7	67.9	3.70		
	130	38.28	18.12	16.555	1.440	.845	1059.2	75.4	5.26	4.07	510.3	61.6	3.65		
	122.5	36.01	18.03	16.512	1.350	.802	994.3	71.1	5.25	4.04	472.3	57.2	3.62		
	115	33.86	17.94	16.475	1.260	.765	935.8	67.2	5.26	4.02	435.5	52.9	3.59		
BT 18 ST 18 WF	97	28.56	18.24	12.117	1.260	.770	904.0	67.3	5.63	4.81	177.7	29.3	2.49		
	91	26.77	18.16	12.072	1.180	.725	844.0	63.0	5.61	4.77	163.9	27.1	2.47		
	85	24.99	18.08	12.027	1.100	.680	784.7	58.8	5.60	4.74	150.3	25.0	2.45		
	80	23.54	18.00	12.000	1.020	.653	741.0	56.0	5.61	4.76	137.7	22.9	2.42		
	75	22.08	17.92	11.972	.940	.625	696.7	53.0	5.62	4.79	125.2	20.9	2.38		
BT 16A ST 16 WF	120	35.26	16.75	15.865	1.400	.830	822.5	63.2	4.83	3.73	437.2	55.1	3.52		
	110	32.36	16.63	15.810	1.275	.775	754.1	58.4	4.83	3.71	391.2	49.5	3.48		
	100	29.40	16.50	15.750	1.150	.715	683.6	53.3	4.82	3.67	345.8	43.9	3.43		
BT 16 ST 16 WF	76	22.35	16.75	11.565	1.055	.635	591.9	47.4	5.15	4.26	128.1	22.1	2.39		
	70.5	20.76	16.66	11.535	.960	.605	551.8	44.7	5.16	4.30	114.9	19.9	2.35		
	65	19.13	16.55	11.510	.855	.580	513.0	42.1	5.18	4.37	100.7	17.5	2.29		
BT 15A ST 15 WF	105	30.89	15.19	15.105	1.315	.775	578.0	48.7	4.33	3.31	354.0	46.9	3.38		
	95	27.95	15.06	15.040	1.185	.710	520.4	44.1	4.31	3.26	312.3	41.5	3.34		
	86	25.32	14.94	14.985	1.065	.655	471.0	40.2	4.31	3.23	275.1	36.7	3.30		
BT 15 ST 15 WF	66	19.41	15.15	10.551	1.000	.615	420.7	37.4	4.66	3.90	92.5	17.5	2.18		
	62	18.22	15.08	10.521	.930	.585	394.8	35.3	4.65	3.90	84.8	16.1	2.16		
	58	17.07	15.00	10.500	.850	.564	371.8	33.6	4.67	3.94	76.6	14.6	2.12		
BT 13A ST 13 WF	54	15.88	14.91	10.484	.760	.548	349.5	32.1	4.69	4.03	67.6	12.9	2.06		
	88.5	26.05	13.655	14.090	1.190	.725	391.8	36.7	3.88	2.97	259.4	36.8	3.16		
	80	23.52	13.54	14.023	1.075	.658	351.4	33.1	3.87	2.91	229.0	32.7	3.12		
BT 13 ST 13 WF	72.5	21.34	13.44	13.965	.975	.600	316.3	29.9	3.85	2.85	203.5	29.1	3.09		
	57	16.77	13.64	10.070	.932	.570	288.9	28.3	4.15	3.42	74.8	14.9	2.11		
	51	15.01	13.535	10.018	.827	.518	257.7	25.4	4.14	3.39	64.8	12.9	2.08		
	47	13.83	13.455	9.990	.747	.490	238.5	23.7	4.15	3.41	57.5	11.2	2.04		

# BETHLEHEM STRUCTURAL TEES



*Theoretical Dimensions and Properties for Designing*

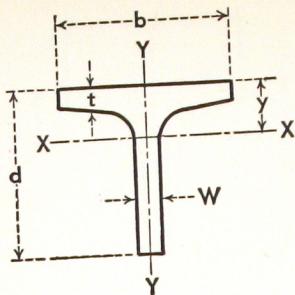
Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange			AXIS X-X				AXIS Y-Y		
				Width	Average Thickness	Stem Thickness	I	S	r	y	I'	S'	r'
				A	d	b	t	W	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>
BT 12B ST 12 WF	80	23.54	12.36	14.091	1.135	.656	271.6	27.6	3.40	2.51	246.3	35.0	3.23
	72.5	21.31	12.245	14.043	1.020	.608	246.2	25.2	3.40	2.48	217.1	30.9	3.19
	65	19.13	12.13	14.000	.900	.565	222.6	23.1	3.41	2.47	187.6	26.8	3.13
BT 12A ST 12 WF	60	17.64	12.155	12.088	.930	.556	213.6	22.4	3.48	2.62	127.0	21.0	2.68
	55	16.18	12.08	12.042	.855	.510	195.2	20.5	3.47	2.57	114.5	19.0	2.66
	50	14.71	12.00	12.000	.775	.468	176.7	18.7	3.46	2.54	101.8	17.0	2.63
BT 12 ST 12 WF	47	13.81	12.145	9.061	.872	.516	185.9	20.3	3.67	2.99	51.1	11.3	1.92
	42	12.35	12.045	9.015	.772	.470	165.9	18.3	3.66	2.97	44.2	9.80	1.89
	38	11.18	11.955	8.985	.682	.440	151.1	16.9	3.68	3.00	38.3	8.51	1.85
BT 10B ST 10 WF	71	20.89	10.73	13.132	1.095	.659	177.3	20.8	2.91	2.18	193.0	29.4	3.04
	63.5	18.67	10.62	13.061	.985	.588	155.8	18.3	2.89	2.11	169.3	25.9	3.01
	56	16.48	10.50	13.000	.865	.527	136.4	16.2	2.88	2.06	144.8	22.3	2.96
BT 10A ST 10 WF	48	14.11	10.57	9.038	.935	.575	137.1	17.1	3.11	2.55	54.7	12.1	1.97
	41	12.05	10.43	8.962	.795	.499	115.4	14.5	3.09	2.48	44.8	10.0	1.93
BT 10 ST 10 WF	36.5	10.73	10.62	8.295	.740	.455	110.2	13.7	3.21	2.60	33.1	7.98	1.76
	34	10.01	10.57	8.270	.685	.430	102.8	12.9	3.20	2.59	30.2	7.30	1.74
	31	9.12	10.495	8.240	.615	.400	93.7	11.9	3.21	2.59	26.6	6.45	1.71
BT 9B ST 9 WF	57	16.77	9.24	11.833	.991	.595	102.6	13.9	2.47	1.85	127.8	21.6	2.76
	52.5	15.45	9.16	11.792	.911	.554	93.9	12.8	2.47	1.82	115.5	19.6	2.73
	48	14.13	9.08	11.750	.831	.512	85.3	11.7	2.46	1.78	103.4	17.6	2.71
BT 9A ST 9 WF	42.5	12.49	9.16	8.838	.911	.526	84.4	11.9	2.60	2.05	49.7	11.3	2.00
	38.5	11.32	9.08	8.787	.831	.475	75.3	10.6	2.58	1.99	44.3	10.1	1.98
	35	10.28	9.00	8.750	.751	.438	68.1	9.67	2.57	1.96	39.2	8.97	1.95
BT 9 ST 9 WF	32	9.40	8.935	8.715	.686	.403	61.8	8.82	2.56	1.93	35.2	8.07	1.93
	30	8.82	9.125	7.558	.695	.416	64.8	9.32	2.71	2.17	23.5	6.23	1.63
	27.5	8.09	9.06	7.532	.630	.390	59.6	8.63	2.71	2.16	21.0	5.57	1.61
BT 8B ST 8 WF	25	7.35	9.00	7.500	.570	.358	53.9	7.85	2.71	2.14	18.6	4.96	1.59
	48	14.13	8.16	11.533	.875	.535	64.7	9.82	2.14	1.57	103.6	18.0	2.71
ST 8 WF	44	12.95	8.08	11.502	.795	.504	59.5	9.11	2.14	1.55	92.6	16.1	2.67

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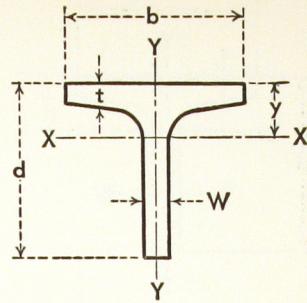


# BETHLEHEM STRUCTURAL TEES

*Theoretical Dimensions and Properties for Designing*

Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange			AXIS X-X				AXIS Y-Y		
				Width	Average Thickness	Stem Thickness	I	S	r	y	I'	S'	r'
BT 8A	39	11.46	8.16	8.586	.875	.529	60.0	9.45	2.28	1.81	43.8	10.2	1.95
	35.5	10.43	8.08	8.543	.795	.486	54.0	8.57	2.28	1.77	38.9	9.11	1.93
	32	9.40	8.00	8.500	.715	.443	48.3	7.71	2.27	1.73	34.2	8.05	1.91
	29	8.52	7.93	8.464	.645	.407	43.6	7.00	2.26	1.70	30.2	7.14	1.88
BT 8	25	7.35	8.125	7.073	.628	.380	42.2	6.77	2.40	1.89	17.4	4.92	1.54
	22.5	6.62	8.06	7.039	.563	.346	37.8	6.10	2.39	1.87	15.2	4.33	1.52
	20	5.88	8.00	7.000	.503	.307	33.2	5.37	2.37	1.82	13.3	3.79	1.50
	18	5.30	7.93	6.992	.428	.299	30.7	5.10	2.41	1.90	11.1	3.17	1.45
BT 7E	105.5	31.04	7.875	15.800	1.563	.980	102.2	16.2	1.81	1.57	514.3	65.1	4.07
	101	29.70	7.815	15.750	1.503	.930	95.7	15.2	1.80	1.53	489.8	62.2	4.06
	96.5	28.36	7.75	15.710	1.438	.890	90.1	14.4	1.78	1.49	465.1	59.2	4.05
	92	27.04	7.69	15.660	1.378	.840	83.9	13.4	1.76	1.45	441.4	56.4	4.04
ST 7 WF	88	25.87	7.625	15.640	1.313	.820	80.2	12.9	1.76	1.42	418.9	53.6	4.02
	83.5	24.55	7.56	15.600	1.248	.780	75.0	12.1	1.75	1.39	395.1	50.7	4.01
	79	23.24	7.50	15.550	1.188	.730	69.3	11.3	1.73	1.34	372.5	47.9	4.00
	75	22.04	7.44	15.515	1.128	.695	64.9	10.6	1.72	1.31	351.3	45.3	3.99
BT 7D	71	20.92	7.375	15.500	1.063	.680	62.1	10.2	1.72	1.29	330.1	42.6	3.97
	68	19.99	7.375	14.740	1.063	.660	60.0	9.89	1.73	1.31	283.9	38.5	3.77
	63.5	18.67	7.31	14.690	.998	.610	54.7	9.04	1.71	1.26	263.8	35.9	3.76
	59.5	17.49	7.25	14.650	.938	.570	50.4	8.36	1.70	1.22	245.9	33.6	3.75
ST 7 WF	55.5	16.33	7.185	14.620	.873	.540	46.7	7.80	1.69	1.19	227.4	31.1	3.73
	51.5	15.13	7.125	14.575	.813	.495	42.4	7.10	1.67	1.15	209.9	28.8	3.72
	47.5	13.97	7.06	14.545	.748	.465	39.1	6.58	1.67	1.12	191.9	26.4	3.71
	43.5	12.78	7.00	14.500	.688	.420	34.9	5.88	1.65	1.08	174.8	24.1	3.70
BT 7C	42	12.36	7.09	12.023	.778	.451	37.4	6.36	1.74	1.21	112.7	18.8	3.02
	39	11.47	7.03	12.000	.718	.428	34.8	5.96	1.74	1.19	103.5	17.2	3.00
BT 7B	37	10.88	7.095	10.072	.783	.450	36.1	6.26	1.82	1.32	66.7	13.3	2.48
	34	10.00	7.03	10.040	.718	.418	33.0	5.74	1.81	1.29	60.6	12.1	2.46
	30.5	8.97	6.955	10.000	.643	.378	29.2	5.13	1.80	1.25	53.6	10.7	2.45
BT 7A	26.5	7.79	6.97	8.062	.658	.370	27.7	4.95	1.88	1.38	28.8	7.14	1.92
	24	7.06	6.905	8.031	.593	.339	24.9	4.49	1.88	1.35	25.6	6.38	1.91
ST 7 WF	21.5	6.32	6.84	8.000	.528	.308	22.2	4.02	1.87	1.33	22.6	5.64	1.89

# BETHLEHEM STRUCTURAL TEES



*Theoretical Dimensions and Properties for Designing*

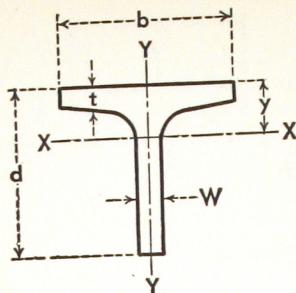
Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange			Stem Thickness	AXIS X-X				AXIS Y-Y			
				Width	Average Thickness	W		I	S	r	y	I'	S'	r'	
								A	d	in.	in.	in.	in.	in.	
BT 7	19	5.59	7.06	6.776	.513	.313	23.5	4.27	2.05	1.56	12.3	3.64	1.49		
ST 7 WF	17	5.00	7.00	6.750	.453	.287	21.1	3.86	2.05	1.55	10.6	3.15	1.46		
	15	4.41	6.93	6.733	.383	.270	19.0	3.55	2.08	1.59	8.77	2.61	1.41		
BT 6C	49.5	14.54	6.375	12.190	.921	.580	33.7	6.46	1.52	1.16	139.1	22.8	3.09		
ST 6 WF	46	13.53	6.31	12.155	.856	.545	31.0	5.98	1.51	1.13	128.2	21.1	3.08		
	42.5	12.49	6.25	12.105	.796	.495	27.8	5.38	1.49	1.08	117.7	19.5	3.07		
	39.5	11.61	6.19	12.080	.736	.470	25.8	5.02	1.48	1.06	108.2	17.9	3.05		
	36	10.58	6.125	12.040	.671	.430	23.1	4.53	1.48	1.02	97.6	16.2	3.04		
	32.5	9.55	6.06	12.000	.606	.390	20.6	4.06	1.47	.98	87.3	14.6	3.02		
BT 6B	29	8.53	6.095	10.014	.641	.359	19.0	3.75	1.49	1.03	53.7	10.7	2.51		
ST 6 WF	26.5	7.80	6.03	10.000	.576	.345	17.7	3.54	1.51	1.02	48.0	9.60	2.48		
BT 6A	25	7.36	6.095	8.077	.641	.371	18.7	3.80	1.60	1.17	28.2	6.98	1.96		
ST 6 WF	22.5	6.62	6.03	8.042	.576	.336	16.6	3.40	1.59	1.13	25.0	6.20	1.94		
	20	5.89	5.97	8.000	.516	.294	14.4	2.94	1.56	1.08	22.0	5.50	1.94		
BT 6	18	5.29	6.12	6.565	.540	.305	15.3	3.14	1.70	1.26	11.9	3.62	1.50		
ST 6 WF	15.5	4.56	6.045	6.525	.465	.265	13.0	2.69	1.69	1.22	9.91	3.04	1.47		
	13.5	3.99	5.980	6.500	.400	.240	11.4	2.39	1.69	1.21	8.30	2.55	1.44		
BT 6L	11.00	3.24	6.16	4.030	.424	.260	11.7	2.58	1.90	1.63	2.27	1.13	.84		
ST 6 L	9.5	2.81	6.08	4.010	.349	.240	10.2	2.32	1.91	1.67	1.84	.92	.81		
	8.25	2.43	6.00	4.000	.269	.230	9.02	2.13	1.93	1.76	1.39	.70	.76		
BT 6J	7.00	2.07	5.96	3.970	.224	.200	7.66	1.83	1.92	1.76	1.13	.57	.74		
ST 6 J															

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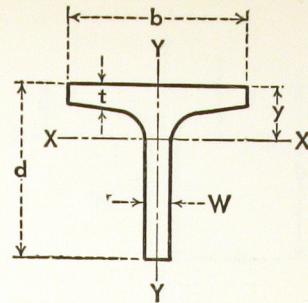


# BETHLEHEM STRUCTURAL TEES

*Theoretical Dimensions and Properties for Designing*

Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange			Stem Thickness	AXIS X-X				AXIS Y-Y			
				Width	Average Thickness	W		I	S	r	y	I'	S'	r'	
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	
BT 5B ST 5 WF	56	16.46	5.69	10.415	1.248	.755	28.8	6.42	1.32	1.21	117.7	22.6	2.67		
	50	14.72	5.56	10.345	1.118	.685	24.8	5.62	1.30	1.14	103.3	20.0	2.65		
	44.5	13.09	5.44	10.275	.998	.615	21.3	4.88	1.28	1.07	90.3	17.6	2.63		
	38.5	11.33	5.31	10.195	.868	.535	17.7	4.10	1.25	1.00	76.7	15.1	2.60		
	36	10.59	5.25	10.170	.808	.510	16.4	3.83	1.24	.97	70.9	13.9	2.59		
	33	9.70	5.19	10.117	.748	.457	14.5	3.39	1.22	.92	64.6	12.8	2.58		
	30	8.83	5.125	10.075	.683	.415	12.8	3.02	1.21	.88	58.2	11.6	2.57		
	27	7.94	5.06	10.028	.618	.368	11.2	2.64	1.18	.84	51.95	10.4	2.56		
	24.5	7.20	5.00	10.000	.558	.340	10.1	2.40	1.18	.81	46.5	9.30	2.54		
BT 5A ST 5 WF	22.5	6.62	5.06	8.022	.618	.350	10.3	2.48	1.25	.91	26.6	6.63	2.00		
	19.5	5.74	4.97	7.990	.528	.318	8.96	2.19	1.25	.88	22.5	5.62	1.98		
	16.5	4.85	4.875	7.964	.433	.292	7.80	1.95	1.27	.88	18.2	4.58	1.94		
BT 5 ST 5 WF	14.5	4.27	5.11	5.799	.500	.289	8.38	2.07	1.40	1.05	7.61	2.62	1.34		
	12.5	3.67	5.04	5.762	.430	.252	7.12	1.77	1.39	1.02	6.34	2.20	1.31		
	10.5	3.10	4.95	5.750	.340	.240	6.31	1.62	1.43	1.06	4.87	1.69	1.25		
BT 4B ST 4 WF	33.5	9.85	4.50	8.287	.933	.575	10.94	3.07	1.05	.94	44.3	10.7	2.12		
	29	8.53	4.375	8.222	.808	.510	9.11	2.60	1.03	.87	37.5	9.10	2.10		
	24	7.06	4.25	8.117	.683	.405	6.92	2.00	.99	.78	30.45	7.50	2.08		
	20	5.88	4.125	8.077	.558	.365	5.80	1.71	.99	.74	24.5	6.05	2.04		
	17.5	5.15	4.06	8.027	.493	.315	4.88	1.45	.97	.69	21.25	5.30	2.03		
	15.5	4.56	4.00	8.000	.433	.288	4.31	1.30	.97	.67	18.5	4.60	2.01		
BT 4A ST 4 WF	14	4.11	4.03	6.540	.463	.285	4.22	1.28	1.01	.73	10.8	3.30	1.62		
	12	3.53	3.965	6.500	.398	.245	3.53	1.08	1.00	.70	9.10	2.80	1.61		
BT 4 ST 4 WF	10	2.94	4.07	5.268	.378	.248	3.66	1.13	1.12	.83	4.25	1.61	1.20		
	8.5	2.50	4.00	5.250	.308	.230	3.21	1.01	1.13	.84	3.36	1.28	1.16		

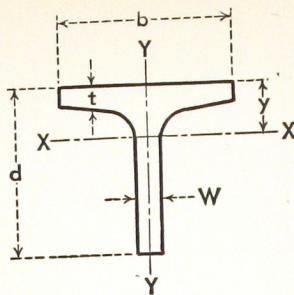
# BETHLEHEM STRUCTURAL TEES



*Theoretical Dimensions and Properties for Designing*

Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness	AXIS X-X				AXIS Y-Y		
				Width	Average Thickness		I	S	r	y	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
BT 6 IA	25	7.35	6.00	5.477	.660	.687	25.2	6.05	1.85	1.84	7.85	2.87	1.03
ST 6 I	20.4	5.99	6.00	5.250	.660	.460	18.8	4.26	1.77	1.57	6.77	2.58	1.06
BT 6 I	17.5	5.14	6.00	5.078	.544	.428	17.2	3.95	1.83	1.65	4.93	1.94	.98
ST 6 I	15.9	4.67	6.00	5.000	.544	.350	14.9	3.31	1.78	1.51	4.68	1.87	1.00
BT 5 I	17.5	5.15	5.00	4.944	.491	.594	12.5	3.63	1.56	1.56	4.18	1.69	.90
ST 5 I	12.7	3.73	5.00	4.660	.491	.310	7.81	2.05	1.45	1.20	3.39	1.46	.95
BT 4 I	11.5	3.38	4.00	4.171	.425	.441	5.03	1.77	1.22	1.15	2.15	1.03	.80
ST 4 I	9.2	2.70	4.00	4.000	.425	.270	3.50	1.14	1.14	.94	1.86	.93	.83
BT 3.5 I	10	2.94	3.50	3.860	.392	.450	3.36	1.36	1.07	1.04	1.58	.82	.73
ST 3.5 I	7.65	2.24	3.50	3.660	.392	.250	2.18	.81	.99	.81	1.32	.72	.77
BT 3 I	8.625	2.53	3.00	3.565	.359	.465	2.13	1.02	.92	.91	1.15	.65	.67
ST 3 I	6.25	1.83	3.00	3.330	.359	.230	1.27	.55	.83	.69	.93	.56	.71





# BETHLEHEM STRUCTURAL TEES

*Theoretical Dimensions and Properties for Designing*

Section Number	Weight per Foot	Area of Section	Depth of Tee	Flange		Stem Thickness W	AXIS X-X				AXIS Y-Y		
				Width	Average Thickness		I	S	r	$\gamma$	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.		in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.

## MISCELLANEOUS

<b>BT 5L</b> ST 5 L	9.5	2.80	5.13	4.020	.394	.250	6.70	1.74	1.55	1.28	2.09	1.04	.86
	8.5	2.49	5.06	4.010	.329	.240	6.07	1.62	1.56	1.32	1.73	.86	.83
	7.5	2.20	5.00	4.000	.269	.230	5.46	1.50	1.57	1.37	1.39	.70	.80
<b>BT 5J</b> ST 5 J	5.75	1.69	4.94	3.950	.204	.180	4.15	1.16	1.57	1.35	1.00	.51	.77
	5.75	1.69	4.94	3.950	.204	.180	4.15	1.16	1.57	1.35	1.00	.51	.77
<b>BT 4L</b> ST 4 L	7.50	2.22	4.06	4.015	.314	.245	3.29	1.07	1.22	1.00	1.65	.82	.86
	6.50	1.91	4.00	4.000	.254	.230	2.90	.98	1.23	1.03	1.31	.66	.83
<b>BT 4J</b> ST 4 J	5.00	1.48	3.95	3.940	.204	.170	2.15	.72	1.21	.96	1.00	.51	.82
	5.00	1.48	3.95	3.940	.204	.170	2.15	.72	1.21	.96	1.00	.51	.82
<b>BT 3L</b> ST 3 L	8.00	2.36	3.13	4.030	.404	.260	1.66	.68	.84	.67	2.16	1.07	.96
	6.00	1.77	3.00	4.000	.279	.230	1.30	.56	.86	.67	1.44	.72	.90
<b>BT 3J</b> ST 3 J	4.25	1.25	2.92	3.940	.194	.170	.90	.40	.85	.64	.94	.48	.87
	4.25	1.25	2.92	3.940	.194	.170	.90	.40	.85	.64	.94	.48	.87

# SPECIAL SHAPES

## *Part II*

Pages 58 to 69, inclusive, cover dimensions, weights and properties of special structural shapes. These shapes are generally used for a special purpose and consequently the rollings are irregular and infrequent. Unless the tonnage of any one size is sufficient in itself to warrant a rolling, the use of these sections should be avoided and sections with regular rollings should be specified. Before specifying any of these special sizes, it is recommended that the Home Office be consulted in regard to delivery possibilities.

These pages cover information on Special Car Building and Shipbuilding Channels; Special Shipbuilding Bulb Angles; Special Car Building Bulb Angles; Car Building Half Center Sill Sections; Car Building Side Plate Section; Car Building Side Post Section; Car Building W-Side Plate Section and Special Rolled Zees.



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SHIP



BULB

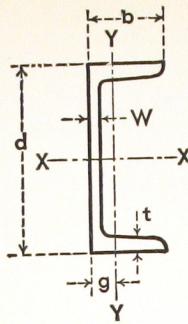


CAR



ZEES

INDEX



# SPECIAL CHANNELS

## Car Building and Shipbuilding

### *Theoretical Dimensions and Properties for Designing*

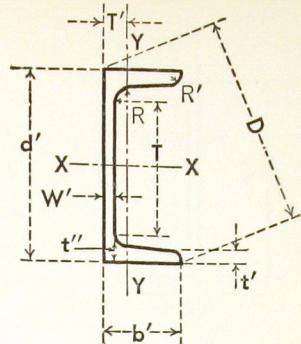
Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Channel	Flange			Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Average Thickness	W		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
<b>SC 18</b>	For details see page 36												
	50.0	14.66	13	4.412	.610	.787	312.9	48.1	4.62	16.7	4.9	1.07	.98
<b>SC 13</b>	40.0	11.71	13	4.185	.610	.560	271.4	41.7	4.82	13.9	4.3	1.09	.97
<b>13 x 4</b>	35.0	10.24	13	4.072	.610	.447	250.7	38.6	4.95	12.5	4.0	1.10	.99
	31.8	9.30	13	4.000	.610	.375	237.5	36.5	5.05	11.6	3.9	1.11	1.01
<b>SC 12B</b>	50.0	14.64	12	4.135	.700	.835	267.9	44.6	4.28	17.8	5.8	1.10	1.06
<b>12 x 4</b>	45.0	13.24	12	4.000	.700	.700	248.4	41.4	4.37	16.0	5.4	1.11	1.05
	40.0	11.70	12	3.890	.700	.590	232.6	38.8	4.46	14.5	5.1	1.11	1.05
	35.0	10.22	12	3.767	.700	.467	214.9	35.8	4.58	12.9	4.8	1.12	1.07
<b>SC 12</b>	37.0	10.80	12	3.600	.600	.600	203.4	33.9	4.34	10.3	3.8	.98	.89
<b>(BSC 25)</b>	32.9	9.60	12	3.500	.600	.500	189.0	31.5	4.44	9.4	3.6	.99	.89
<b>12 x 3½</b>	30.9	9.00	12	3.450	.600	.450	181.8	30.3	4.50	8.9	3.5	.99	.90
<b>SC 10B</b>	*41.1	12.06	10	4.319	.575	.794	156.3	31.3	3.61	16.4	5.1	1.17	1.11
<b>10 x 4</b>	33.6	9.80	10	4.100	.575	.575	138.0	27.6	3.75	13.7	4.6	1.18	1.11
	28.5	8.30	10	3.950	.575	.425	125.5	25.1	3.89	11.8	4.2	1.19	1.15
<b>SC 10</b>	28.3	8.23	10	3.500	.575	.475	116.9	23.4	3.77	8.6	3.4	1.02	.96
<b>(BSC 20)</b>	24.9	7.23	10	3.400	.575	.375	108.6	21.7	3.88	7.6	3.2	1.03	.98
<b>10 x 3½</b>	25.3	7.38	10	3.550	.500	.425	106.0	21.2	3.79	7.9	3.0	1.04	.94
	21.9	6.38	10	3.450	.500	.325	97.6	19.5	3.91	7.0	2.8	1.05	.98

Dimensions and properties of corresponding British standard section are shown opposite the British number marked BSC.

marked BSC.  
\* Rolled by arrangement for cars.

# SPECIAL CHANNELS

## Car Building and Shipbuilding



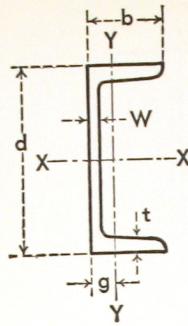
Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange			Web Thickness (Nominal)	Tangent Web (Nominal)	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Round- ing (Toe)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	deg
<b>SC 18</b>												
	For details see page	see page	see page	see page	see page	see page	see page	see page	see page	see page	see page	see page
<b>SC 13</b>	50	13	4 $\frac{1}{8}$	5 $\frac{1}{16}$	7 $\frac{1}{8}$	1 $\frac{3}{16}$	10 $\frac{3}{8}$	1 $\frac{3}{16}$	13 $\frac{3}{4}$	.48	.23	8.5
13 x 4	40	13	4 $\frac{1}{8}$	5 $\frac{1}{16}$	7 $\frac{1}{8}$	9 $\frac{1}{16}$	10 $\frac{3}{8}$	1	13 $\frac{5}{8}$	.48	.23	8.5
	35	13	4 $\frac{1}{8}$	5 $\frac{1}{16}$	7 $\frac{1}{8}$	7 $\frac{1}{16}$	10 $\frac{3}{8}$	7 $\frac{1}{8}$	13 $\frac{5}{8}$	.48	.23	8.5
	31.8	13	4	5 $\frac{1}{16}$	7 $\frac{1}{8}$	3 $\frac{1}{8}$	10 $\frac{3}{8}$	1 $\frac{3}{16}$	13 $\frac{5}{8}$	.48	.23	8.5
<b>SC 12B</b>	50	12	4 $\frac{1}{8}$	5 $\frac{1}{8}$	3 $\frac{1}{4}$	7 $\frac{1}{8}$	9 $\frac{1}{2}$	1 $\frac{5}{16}$	12 $\frac{3}{4}$	.50	.30	1.7
12 x 4	45	12	4	5 $\frac{1}{8}$	3 $\frac{1}{4}$	1 $\frac{1}{16}$	9 $\frac{1}{2}$	1 $\frac{3}{16}$	12 $\frac{5}{8}$	.50	.30	1.7
	40	12	3 $\frac{7}{8}$	5 $\frac{1}{8}$	3 $\frac{1}{4}$	5 $\frac{1}{8}$	9 $\frac{1}{2}$	1 $\frac{1}{16}$	12 $\frac{5}{8}$	.50	.30	1.7
	35	12	3 $\frac{3}{4}$	5 $\frac{1}{8}$	3 $\frac{1}{4}$	1 $\frac{1}{2}$	9 $\frac{1}{2}$	1 $\frac{5}{16}$	12 $\frac{5}{8}$	.50	.30	1.7
<b>SC 12</b> (BSC 25)	37	12	3 $\frac{5}{8}$	9 $\frac{1}{16}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	9 $\frac{1}{2}$	1 $\frac{3}{16}$	12 $\frac{1}{2}$	.60	.425	2
12 x 3 $\frac{1}{2}$	32.9	12	3 $\frac{1}{2}$	9 $\frac{1}{16}$	5 $\frac{1}{8}$	1 $\frac{1}{2}$	9 $\frac{1}{2}$	1 $\frac{1}{16}$	12 $\frac{1}{2}$	.60	.425	2
	30.9	12	3 $\frac{1}{2}$	9 $\frac{1}{16}$	5 $\frac{1}{8}$	7 $\frac{1}{16}$	9 $\frac{1}{2}$	1	12 $\frac{1}{2}$	.60	.425	2
<b>SC 10B</b> 10 x 4	*41.1	10	4 $\frac{5}{16}$	1 $\frac{1}{2}$	5 $\frac{1}{8}$	1 $\frac{3}{16}$	7 $\frac{5}{8}$	1 $\frac{1}{4}$	10 $\frac{7}{8}$	.575	.40	2
	33.6	10	4 $\frac{1}{8}$	1 $\frac{1}{2}$	5 $\frac{1}{8}$	9 $\frac{1}{16}$	7 $\frac{5}{8}$	1 $\frac{1}{8}$	10 $\frac{4}{5}$	.575	.40	2
	28.5	10	4	1 $\frac{1}{2}$	5 $\frac{1}{8}$	7 $\frac{1}{16}$	7 $\frac{5}{8}$	1	10 $\frac{4}{5}$	.575	.40	2
<b>SC 10</b> (BSC 20)	28.3	10	3 $\frac{1}{2}$	1 $\frac{1}{2}$	5 $\frac{1}{8}$	1 $\frac{1}{2}$	7 $\frac{5}{8}$	1	10 $\frac{5}{8}$	.575	.40	2
10 x 3 $\frac{1}{2}$	24.9	10	3 $\frac{3}{8}$	1 $\frac{1}{2}$	5 $\frac{1}{8}$	3 $\frac{1}{8}$	7 $\frac{5}{8}$	1 $\frac{5}{16}$	10 $\frac{1}{2}$	.575	.40	2
<b>SC 10A</b> 10 x 3 $\frac{1}{2}$	25.3	10	3 $\frac{1}{2}$	7 $\frac{1}{16}$	9 $\frac{1}{16}$	7 $\frac{1}{16}$	7 $\frac{7}{8}$	1 $\frac{5}{16}$	10 $\frac{5}{8}$	.50	.35	2
	21.9	10	3 $\frac{1}{2}$	7 $\frac{1}{16}$	9 $\frac{1}{16}$	5 $\frac{1}{16}$	7 $\frac{7}{8}$	1 $\frac{3}{16}$	10 $\frac{5}{8}$	.50	.35	2

Dimensions and properties of corresponding British standard section are shown opposite the British number marked BSC.

\* Rolled by arrangement for cars.

**BULB**  
**CAR**  
**ZEES**



# SPECIAL CHANNELS

## Car Building and Shipbuilding

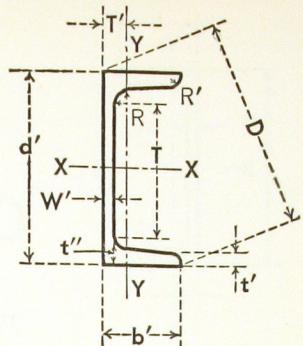
*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Channel	Flange			Web Thickness	AXIS X-X			AXIS Y-Y			
				Width	Average Thickness	W		I	S	r	I'	S'	r'	g
				in.	in.	in.		in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.
<b>SC 9</b> (BSC 17)	25.4	7.41	9	3.500	.550	.450	87.3	19.4	3.43	8.0	3.2	1.04	1.00	
9 x 3½	23.9	6.96	9	3.450	.550	.400	84.3	18.7	3.48	7.5	3.1	1.04	1.01	
<b>SC 8</b> (BSC 13)	22.8	6.63	8	3.500	.525	.425	63.3	15.8	3.09	7.4	3.0	1.05	1.04	
8 x 3½	21.4	6.23	8	3.450	.525	.375	61.2	15.3	3.13	6.9	2.9	1.05	1.05	
<b>SC 8A</b> 8 x 3	20.0	5.83	8	3.025	.500	.400	54.0	13.5	3.05	4.7	2.2	.90	.86	
	18.7	5.43	8	2.975	.500	.350	51.9	13.0	3.09	4.4	2.1	.90	.88	
<b>SC 7</b> 7 x 3½	22.7	6.60	7	3.600	.500	.500	47.1	13.5	2.67	7.5	3.0	1.07	1.07	
	19.1	5.55	7	3.450	.500	.350	42.8	12.2	2.78	6.3	2.7	1.07	1.11	
<b>SC 7B</b> (BSC 9)	17.6	5.12	7	3.000	.475	.375	37.3	10.7	2.70	4.2	2.0	.90	.90	
7 x 3														

Dimensions and properties of corresponding British standard section are shown opposite the British number marked BSC.

# SPECIAL CHANNELS

## Car Building and Shipbuilding

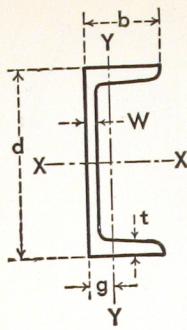


Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Rounding (Toe)	Slope Inside Flange
			d'	b'	t'	t''							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	deg
<b>SC 9</b> (BSC 17)	25.4	9	3½	½	5/8	7/16	6¾	1	9 5/8	.550	.375	.375	2.0
9 x 3½	23.9	9	3½	½	5/8	7/16	6¾	1 5/16	9 5/8	.550	.375	.375	2.0
<b>SC 8</b> (BSC 13)	22.8	8	3½	½	9/16	7/16	5 7/8	1 5/16	8 3/4	.525	.375	.375	2.0
8 x 3½	21.4	8	3½	½	9/16	3/8	5 7/8	7/8	8 3/4	.525	.375	.375	2.0
<b>SC 8A</b> 8 x 3	20.0	8	3	7/16	9/16	7/16	5 7/8	7/8	8 1/2	.500	.350	.350	2.0
	18.7	8	3	7/16	9/16	3/8	5 7/8	1 3/16	8 1/2	.500	.350	.350	2.0
<b>SC 7</b> 7 x 3½	22.7	7	3 5/8	7/16	9/16	1/2	4 7/8	1	7 7/8	.500	.350	.350	2.0
	19.1	7	3½	7/16	9/16	3/8	4 7/8	1 3/16	7 7/8	.500	.350	.350	2.0
<b>SC 7B</b> (BSC 9)	17.6	7	3	7/16	½	3/8	5	1 3/16	7 5/8	.475	.325	.325	2.0
7 x 3													

Dimensions and properties of corresponding British standard section are shown opposite the British number marked BSC.





# SPECIAL CHANNELS

## Car Building and Shipbuilding

*Theoretical Dimensions and Properties for Designing*

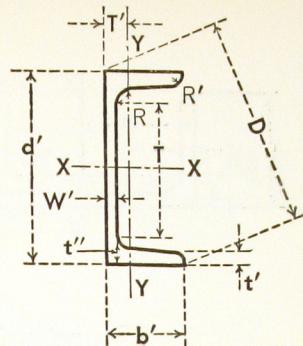
Section Number and Nominal Size	Weight per Foot	Area of Section	Depth of Channel	Flange			Web Thickness	AXIS X-X			AXIS Y-Y		
				Width	Average Thickness	W		I	S	r	I'	S'	r'
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
<b>SC 6</b> (BSC 8) 6 x 3½	18.0	5.22	6	3.500	.475	.375	29.4	9.8	2.38	6.1	2.6	1.08	1.15
<b>SC 6A</b> 6 x 3½	15.3	4.47	6	3.500	.385	.340	25.3	8.4	2.38	5.1	2.1	1.07	1.08
<b>SC 6C</b> (BSC 7) 6 x 3	16.3	4.75	6	3.000	.475	.375	25.8	8.6	2.33	4.0	1.9	.91	.95
<b>SC 6B</b> (BSC 5) 6 x 2½	12.0	3.52	6	2.500	.375	.313	18.6	6.2	2.30	2.0	1.1	.75	.72
<b>*SC 3</b> 3 x 1⅜	9.0	2.64	3	2.125	.351	.500	3.1	2.1	1.09	.97	.68	.61	.70
	7.1	2.08	3	1.938	.351	.312	2.7	1.8	1.14	.71	.56	.59	.67

Dimensions and properties of corresponding British standard section are shown opposite the British number marked BSC.

\* SC 3B has same dimensions as SC 3 except that flanges flare outward to 3 ½ in. across the toe.

# SPECIAL CHANNELS

## Car Building and Shipbuilding

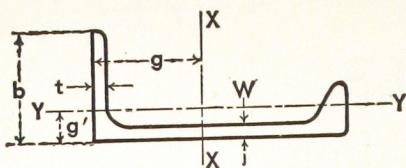


Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Depth (Nominal) of Section	Flange				Web Thickness (Nominal)	Tangent Web (Nominal)	Distance (Nominal)	Diagonal Dimension (Nominal)	Radius of Fillet (Root)	Radius of Rounding (Toe)	Slope Inside Flange
			Width (Nominal)	Thickness (Nominal) at Toe	Thickness (Nominal) at Root	t'							
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	deg
<b>SC 6</b> (BSC 8) 6 x 3½	18.0	6	3½	7/16	1/2	7/16	3/8	4	1 3/16	7	.475	.325	2.0
<b>SC 6A</b> 6 x 3½	15.3	6	3½	5/16	7/16	3/8	4 3/8	4 3/8	1 1/16	7	.385	.300	2.0
<b>SC 6C</b> (BSC 7) 6 x 3	16.3	6	3	7/16	1/2	7/16	3/8	4	1 3/16	6 3/4	.475	.325	2.0
<b>SC 6B</b> (BSC 5) 6 x 2½	12.0	6	2½	5/16	7/16	5/16	4 1/2	4 1/2	1 1/16	6 1/2	.375	.260	2.0
<b>SC 3</b> 3 x 1 1/8	9.0	3	2 1/8	5/16	3/8	1/2	1 1/8	1 1/8	1 1/16	3 5/8	.190	.060	2.7
	7.1	3	2	5/16	3/8	5/16	1 1/8	1 1/8	1/2	3 5/8	.190	.060	2.7

Dimensions and properties of corresponding British standard section are shown opposite the British number marked BSC.





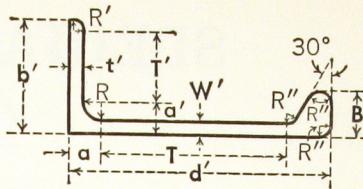
# SPECIAL BULB ANGLES Shipbuilding

*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Flange Thickness	Flange Width	Web Thickness	AXIS X-X				AXIS Y-Y			
						I	S	r	g	I'	S'	r'	g'
						lb	in. <sup>2</sup>	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.
<b>BA 103</b> <i>10 x 3 1/2</i>	32.3	9.49	.61	3.69	.64	118.1	22.1	3.53	4.69	6.2	2.2	0.81	0.77
	29.9	8.78	.58	3.63	.58	110.7	20.9	3.55	4.70	5.6	2.0	0.80	0.75
	27.2	7.98	.485	3.57	.52	102.9	19.6	3.59	4.80	5.1	1.8	0.80	0.72
	24.8	7.28	.455	3.51	.46	95.4	18.4	3.62	4.82	4.6	1.6	0.80	0.70
	22.4	6.57	.425	3.45	.40	88.0	17.2	3.66	4.85	4.1	1.5	0.79	0.68
<b>BA 93</b> <i>9 x 3 1/2</i>	23.8	7.00	.465	3.57	.50	73.3	15.1	3.24	4.19	4.7	1.7	0.82	0.72
	21.6	6.35	.435	3.51	.44	67.7	14.1	3.27	4.21	4.2	1.5	0.82	0.70
	19.4	5.70	.405	3.45	.38	62.2	13.1	3.30	4.22	3.7	1.4	0.81	0.68
<b>BA 84</b> <i>8 x 3 1/2</i>	24.3	7.14	.55	3.68	.58	57.0	12.7	2.83	3.53	5.2	1.9	0.85	0.78
	20.0	5.87	.43	3.56	.46	48.9	11.1	2.89	3.61	4.2	1.5	0.85	0.72
	16.0	4.70	.37	3.44	.34	40.9	9.4	2.95	3.62	3.3	1.2	0.84	0.69
<b>BA 74</b> <i>7 x 3 1/2</i>	21.1	6.19	.54	3.68	.56	37.5	9.2	2.46	2.95	4.8	1.8	0.88	0.80
	17.1	5.03	.41	3.56	.44	32.0	8.0	2.52	3.03	3.9	1.4	0.88	0.74
	13.6	3.98	.35	3.44	.32	26.4	6.7	2.58	3.01	3.0	1.1	0.87	0.71
<b>BA 64</b> <i>6 x 3 1/2</i>	17.4	5.12	.49	3.69	.52	22.7	6.3	2.10	2.42	4.3	1.6	0.92	0.82
	13.9	4.06	.365	3.57	.40	19.0	5.3	2.16	2.47	3.4	1.2	0.91	0.76
	10.7	3.13	.305	3.45	.28	15.3	4.4	2.21	2.45	2.6	0.94	0.91	0.73
<b>BA 52</b> <i>5 x 2 1/2</i>	9.8	2.88	.33	2.56	.36	9.1	3.1	1.78	2.06	1.1	0.56	0.63	0.55
	7.3	2.13	.27	2.44	.24	7.1	2.4	1.83	2.01	0.81	0.42	0.62	0.51

# SPECIAL BULB ANGLES

## Shipbuilding



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Flange		Web		Width of Bulb (Nominal)	Tangents				Radius of Fillet (Root)	Radii of Roundings	
		Width (Nominal)	Thickness (Nominal)	Depth (Nominal)	Thickness (Nominal)		Web (Nominal)	Flange (Nominal)	R	R'	R''		
		b'	t'	d'	W'		a	T	a'	T'	in.	in.	in.
		lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
BA 103 10 x 3½	32.3	3¾	5/8	10	5/8	11 5/16	1 1/8	7 3/8	1 1/16	2 1/4	.54	.27	.40
	29.9	3 5/8	9/16	10	9/16	1 7/8	1 1/8	7 3/8	1 1/8	2 1/4	.54	.27	.40
	27.2	3 5/8	1/2	10	1/2	1 13/16	1	7 3/8	1 1/16	2 1/4	.54	.27	.40
	24.8	3 1/2	7/16	10	7/16	1 3/4	1	7 3/8	1	2 1/4	.54	.27	.40
	22.4	3 1/2	7/16	10	5/8	1 11/16	1 5/16	7 3/8	1 5/16	2 1/4	.54	.27	.40
BA 93 9 x 3½	23.8	3 5/8	7/16	9	1/2	1 11/16	1	6 9/16	1 1/16	2 1/4	.54	.27	.36
	21.6	3 1/2	7/16	9	7/16	1 5/8	1	6 9/16	1	2 1/4	.54	.27	.36
	19.4	3 1/2	5/8	9	5/8	1 9/16	1 5/16	6 9/16	1 5/16	2 1/4	.54	.27	.36
BA 84 8 x 3½	24.3	3 5/8	9/16	8	9/16	1 5/8	1 1/16	5 3/4	1 1/8	2 5/16	.54	.27	.32
	20.0	3 1/2	7/16	8	7/16	1 1/2	1	5 3/4	1	2 5/16	.54	.27	.32
	16.0	3 1/2	5/8	8	5/16	1 3/8	1 5/16	5 3/4	7/8	2 5/16	.54	.27	.32
BA 74 7 x 3½	21.1	3 5/8	9/16	7	9/16	1 1/2	1 1/16	4 15/16	1 1/8	2 5/16	.54	.27	.28
	17.1	3 1/2	7/16	7	7/16	1 3/8	1 5/16	4 15/16	1	2 5/16	.54	.27	.28
	13.6	3 1/2	5/8	7	5/16	1 1/4	7/8	4 15/16	7/8	2 5/16	.54	.27	.28
BA 64 6 x 3½	17.4	3¾	1/2	6	1/2	1 5/16	1	4 3/16	1 1/16	2 3/8	.54	.27	.24
	13.9	3 5/8	5/8	6	3/8	1 3/16	7/8	4 3/16	1 5/16	2 3/8	.54	.27	.24
	10.7	3 1/2	5/16	6	1/4	1 1/16	7/8	4 3/16	1 3/16	2 3/8	.54	.27	.24
BA 52 5 x 2½	9.8	2 1/2	5/16	5	3/8	1	3/4	3 1/2	3/4	1 1/16	.42	.21	.20
	7.3	2 1/2	1/4	5	1/4	7/8	1 1/16	3 1/2	1 1/16	1 1/16	.42	.21	.20

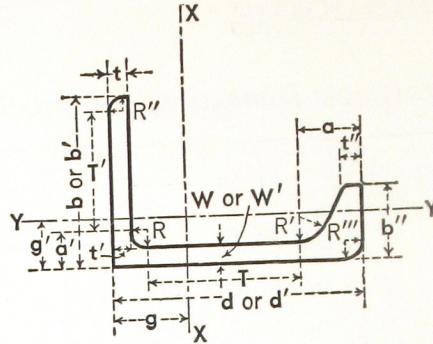
 BULB

 CAR

 ZEES

# SPECIAL BULB ANGLES

## Car Building



*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section A	Depth of Section d	Web Thickness W	Flange Width b	AXIS X-X				AXIS Y-Y			
						in. <sup>4</sup>	in. <sup>3</sup>	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.
<b>BA 5</b> 5 x 4½	19.1	5.64	5.00	.438	4.50	20.7	7.9	1.92	2.38	8.0	2.4	1.19	1.19
<b>BA 5A</b> 5 x 3½	13.0	3.81	5.00	.375	3.50	13.4	4.8	1.88	2.22	3.3	1.2	.93	.86
<b>BA 4</b> 4 x 3½	11.9	3.48	4.00	.375	3.50	7.9	3.5	1.50	1.77	3.1	1.2	.94	.94
<b>BA 4A</b> 4 x 3½	14.3	4.20	4.00	.500	3.50	8.7	3.7	1.44	1.65	3.8	1.5	.96	.99

*Approximate Dimensions for Detailing*

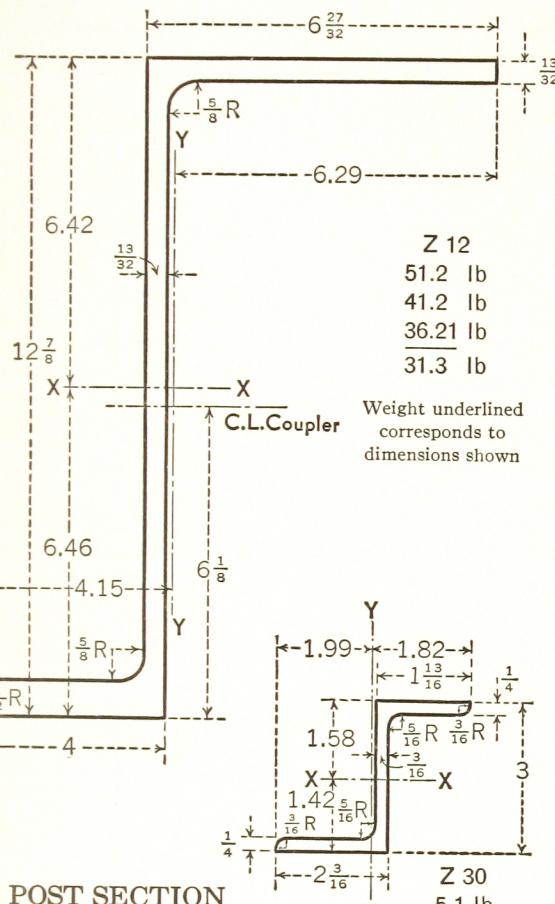
Section Number and Nominal Size	Weight per Foot	Depth (Nom) of Section d'	Flange				Bulb				Tangents				Radii of Roundings			
			Width (Nom) b'	Thickness at Toe (Nom) t	Thickness at Root (Nom) t'	Web Thickness (Nom) W'	Width (Nom) b''	Thickness (Nom) t''	Web (Nominal)	Flange (Nominal)	Radius of Fillet (Root) R	R'	R''	R'''				
<b>BA 5</b> 5 x 4½	19.1	5	4½	7/16	7/16	7/16	2½	9/16	1 5/8	2 9/16	13/16	3 5/16	3/8	½	3/8	½		
<b>BA 5A</b> 5 x 3½	13.0	5	3½	3/8	3/8	3/8	1½	7/16	1 ¼	3	¾	2 7/16	3/8	½	5/16	3/8		
<b>BA 4</b> 4 x 3½	11.9	4	3½	3/8	3/8	3/8	1½	½	1 1/32	1 3 1/32	¾	2 7/16	¾	½	5/16	¾		
<b>BA 4A</b> 4 x 3½	14.3	4	3½	½	½	½	1½	½	1 ¼	1 7/8	7/8	2 5/16	¾	½	5/16	¾		

# SPECIAL SECTIONS

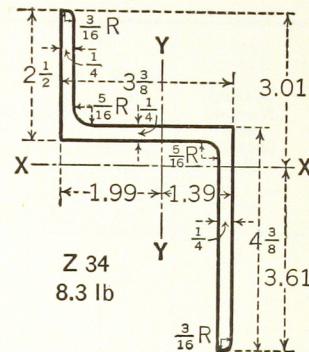
## Car Building

(All dimensions are in inches)

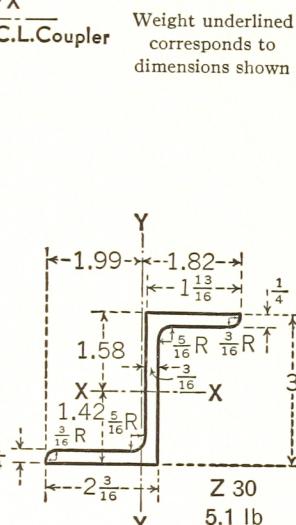
### HALF CENTER SILL SECTION



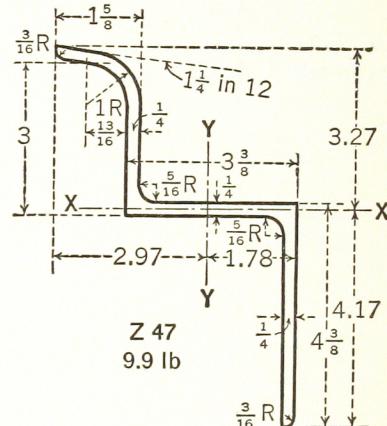
### SIDE PLATE SECTION



### SIDE POST SECTION

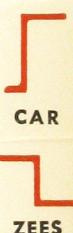


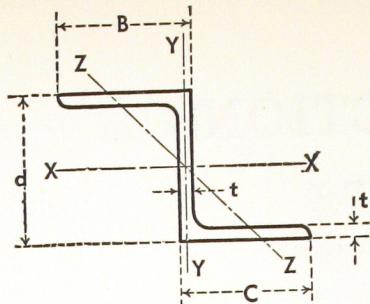
### W-SIDE PLATE SECTION



### Theoretical Dimensions and Properties for Designing

Section Number	Depth	Weight per Foot	Area	AXIS X-X			AXIS Y-Y		
				I	S	r	I'	S'	r'
Z 12	13 1/16	51.2	15.06	373.66	55.79	4.98	71.02	11.16	2.17
	12 15/16	41.2	12.12	313.02	47.51	5.08	59.14	9.41	2.21
	12 7/8	36.21	10.65	276.10	42.75	5.09	51.38	8.17	2.20
	12 13/16	31.3	9.20	240.97	37.08	5.12	43.76	6.94	2.18
Z 30	3	5.10	1.50	2.13	1.34	1.19	1.16	0.58	0.88
Z 34	3 3/8	8.30	2.44	6.53	1.81	1.64	4.48	2.25	1.36
Z 47	7 7/16	9.9	2.89	11.26	2.70	1.97	6.94	2.34	1.55



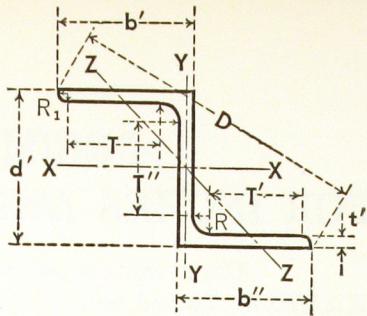


## SPECIAL ZEES

*Theoretical Dimensions and Properties for Designing*

Section Number and Nominal Size	Weight per Foot	Area of Section	Flange			Depth of Section	Flange and Stem Thickness	AXIS X-X			AXIS Y-Y			AXIS Z-Z
			A	B	C			I	S	r	I'	S'	r'	r''
	lb	in. <sup>2</sup>	in.	in.	in.	in.	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in. <sup>4</sup>	in. <sup>3</sup>	in.	in.
<b>Z 4A</b> <b>4 x 3</b>	15.9	4.66	3.12	3.12	3.12	4.06	.500	11.2	5.5	1.55	8.0	2.8	1.31	.67
<b>Z 4</b> <b>4 x 3</b>	12.5 10.3 8.2	3.66 3.03 2.41	3.19 3.12 3.06	3.19 3.12 3.06	3.19 3.12 3.06	4.12 4.06 4.00	.375 .312 .250	9.6 7.9 6.3	4.7 3.9 3.1	1.62 1.62 1.62	6.8 5.5 4.2	2.3 1.8 1.4	1.36 1.34 1.33	.69 .68 .67
<b>Z 3B</b> <b>3 x 2<math>\frac{3}{4}</math></b>	12.6	3.69	2.69	2.69	2.69	3.00	.500	4.6	3.1	1.12	4.9	2.0	1.15	.53
<b>Z 3A</b> <b>3 x 2<math>\frac{3}{4}</math></b>	9.8	2.86	2.69	2.69	2.69	3.00	.375	3.9	2.6	1.16	3.9	1.6	1.17	.54
<b>Z 3</b> <b>3 x 2<math>\frac{3}{4}</math></b>	6.7	1.97	2.69	2.69	2.69	3.00	.250	2.9	1.9	1.21	2.8	1.1	1.19	.55

# SPECIAL ZEES



Approximate Dimensions for Detailing

Section Number and Nominal Size	Weight per Foot	Flanges			Depth (Approx)	Flange and Stem Thickness	Radii		Tangents			Diagonal Distance
		Width (Approx)	Width (Approx)	Depth (Approx)			Fillets	Roundings (Approx)	T	T'	T''	
		b'	b''	d'			in.	in.	in. (Approx)	in. (Approx)	in. (Approx)	
	lb	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
<b>Z 4A</b> 4 x 3	15.9	3 1/8	3 1/8	4 1/16	1/2	5/16	3/8	1 5/16	1 5/16	2 7/16	7 1/16	
<b>Z 4</b> 4 x 3	12.5	3 3/16	3 3/16	4 1/8	3/8	5/16	1/4	2 1/4	2 1/4	2 3/4	7 1/4	
	10.3	3 1/8	3 1/8	4 1/16	5/16	5/16	1/4	2 1/4	2 1/4	2 13/16	7 3/16	
	8.2	3 1/16	3 1/16	4	1/4	5/16	1/4	2 1/4	2 1/4	2 7/8	7 1/8	
<b>Z 3B</b> 3 x 2 3/4	12.6	2 11/16	2 11/16	3	1/2	5/16	3/8	1 1/2	1 1/2	1 3/8	5 3/4	
<b>Z 3A</b> 3 x 2 3/4	9.8	2 11/16	2 11/16	3	3/8	5/16	5/16	1 11/16	1 11/16	1 5/8	5 13/16	
<b>Z 3</b> 3 x 2 3/4	6.7	2 11/16	2 11/16	3	1/4	5/16	3/16	1 5/16	1 5/16	1 7/8	5 15/16	



# DECIMALS OF A FOOT FOR INCHES AND FRACTIONS OF AN INCH

Use of table in estimating weights of cut-to-length sections:

**EXAMPLE:** To find weight of 7 pieces, B 12 L (16.5 lb per ft), 29 ft 5 $\frac{1}{2}$  in. long.  
 Weight of one piece =  $16.5 \times 29.448$  (from table) = 485.9 lb.  
 Weight of 7 pieces =  $7 \times 485.9 = 3401.3$  lb.

Inches	0	1	2	3	4	5	Inches
0	0	.083	.167	.25	.333	.417	0
$\frac{1}{8}$	.01	.094	.177	.26	.344	.427	$\frac{1}{8}$
$\frac{1}{4}$	.021	.104	.188	.271	.354	.438	$\frac{1}{4}$
$\frac{3}{8}$	.031	.115	.198	.281	.365	.448	$\frac{3}{8}$
$\frac{1}{2}$	.042	.125	.208	.292	.375	.458	$\frac{1}{2}$
$\frac{5}{8}$	.052	.135	.219	.302	.385	.469	$\frac{5}{8}$
$\frac{3}{4}$	.063	.146	.229	.313	.396	.479	$\frac{3}{4}$
$\frac{7}{8}$	.073	.156	.24	.323	.406	.49	$\frac{7}{8}$
Inches	6	7	8	9	10	11	Inches
0	.5	.583	.667	.75	.833	.917	0
$\frac{1}{8}$	.51	.594	.677	.76	.844	.927	$\frac{1}{8}$
$\frac{1}{4}$	.521	.604	.688	.771	.854	.938	$\frac{1}{4}$
$\frac{3}{8}$	.531	.615	.698	.781	.865	.948	$\frac{3}{8}$
$\frac{1}{2}$	.542	.625	.708	.792	.875	.958	$\frac{1}{2}$
$\frac{5}{8}$	.552	.635	.719	.802	.885	.969	$\frac{5}{8}$
$\frac{3}{4}$	.563	.646	.729	.813	.896	.979	$\frac{3}{4}$
$\frac{7}{8}$	.573	.656	.74	.823	.906	.99	$\frac{7}{8}$

# DECIMALS OF AN INCH FOR EACH 64<sup>TH</sup>

*With Millimeter Equivalents*

Fraction	$\frac{1}{64}$ ths	Decimal Equivalent	Millimeters	Fraction	$\frac{1}{64}$ ths	Decimal Equivalent	Millimeters
$\frac{1}{32}$	1	.015625	0.39688	$\frac{17}{32}$	33	.515625	13.09690
	2	.03125	0.79375		34	.53125	13.49378
	3	.046875	1.19063		35	.546875	13.89065
	4	.0625	1.58750		36	.5625	14.28753
$\frac{3}{32}$	5	.078125	1.98438	$\frac{19}{32}$	37	.578125	14.68440
	6	.09375	2.38125		38	.59375	15.08128
	7	.109375	2.77813		39	.609375	15.47816
	8	.125	3.17501		40	.625	15.87503
$\frac{5}{32}$	9	.140625	3.57188	$\frac{21}{32}$	41	.640625	16.27191
	10	.15625	3.96876		42	.65625	16.66878
	11	.171875	4.36563		43	.671875	17.06566
	12	.1875	4.76251		44	.6875	17.46253
$\frac{7}{32}$	13	.203125	5.15939	$\frac{23}{32}$	45	.703125	17.85941
	14	.21875	5.55626		46	.71875	18.25629
	15	.234375	5.95314		47	.734375	18.65316
	16	.25	6.35001		48	.75	19.05004
$\frac{9}{32}$	17	.265625	6.74689	$\frac{25}{32}$	49	.765625	19.44691
	18	.28125	7.14376		50	.78125	19.84379
	19	.296875	7.54064		51	.796875	20.24067
	20	.3125	7.93752		52	.8125	20.63754
$\frac{11}{32}$	21	.328125	8.33439	$\frac{27}{32}$	53	.828125	21.03442
	22	.34375	8.73127		54	.84375	21.43129
	23	.359375	9.12814		55	.859375	21.82817
	24	.375	9.52502		56	.875	22.22504
$\frac{13}{32}$	25	.390625	9.92189	$\frac{29}{32}$	57	.890625	22.62192
	26	.40625	10.31877		58	.90625	23.01880
	27	.421875	10.71565		59	.921875	23.41567
	28	.4375	11.11252		60	.9375	23.81255
$\frac{15}{32}$	29	.453125	11.50940	$\frac{31}{32}$	61	.953125	24.20942
	30	.46875	11.90627		62	.96875	24.60630
	31	.484375	12.30315		63	.984375	25.00318
	32	.5	12.70003		64	1.	25.40005

# INDEX

	Pages
<b>A</b>	
American standard beams, properties and dimensions for detailing.....	32-35
American standard beams and channels, rolling and cutting tolerances.....	7
American standard channels, properties and dimensions for detailing.....	36-39
Angles, equal legs, dimensions and properties of.....	40, 41
Angles, unequal legs, dimensions and properties of.....	42-45
Angles, bulb angles, zees and tees, rolling and cutting tolerances.....	8
Areas, methods of computing.....	2
Areas of sections: See properties.	
<b>B</b>	
Beams, properties and dimensions for detailing American standard.....	32-35
Beams, properties and dimensions for detailing Bethlehem.....	14-29
Bearing piles, properties of Bethlehem.....	48
Bethlehem beams; See Bethlehem wide flange shapes.	
Bethlehem bearing piles, properties and dimensions of.....	48
Bethlehem joists, properties and dimensions for detailing.....	30, 31
Bethlehem light beams, properties and dimensions for detailing.....	28-29
Bethlehem light columns, properties and dimensions for detailing.....	28, 29
Bethlehem stanchions, properties and dimensions for detailing.....	30, 31
Bethlehem steel sheet piling, dimensions and properties of.....	46, 47
Bethlehem structural (split beam) tees, notes on.....	49
Bethlehem structural (split beam) tees, dimensions and properties of.....	50-56
Bethlehem wide-flange shapes, cambering of.....	4, 11
Bethlehem wide-flange shapes, properties and dimensions for detailing.....	14-29
Bethlehem wide-flange shapes, rolling and cutting tolerances.....	6
Bulb angles, dimensions and properties for (special) car building and (special) shipbuilding.....	64-66
<b>C</b>	
Camber and sweep, positions for measuring.....	9
Cambering of Bethlehem wide-flange shapes.....	4, 11
Cambering limits, specifications on surface finish, and mill practices.....	4-11
Car building bulb angles, properties and dimensions for detailing special.....	66
Car building special sections, dimensions and properties of	
half center sill section.....	67
side plate section.....	67
side post section.....	67
W-side plate section.....	67
Car building and shipbuilding channels (special), detailing dimensions and properties.....	58-63
Center of gravity of sections: See properties.	
Channels, detailing dimensions and properties for car and shipbuilding (special).....	58-63
Channels, detailing dimensions and properties for American standard.....	36-39
Channels, structural sizes, rolling and cutting tolerances.....	7
Computation of areas, weights, and properties of sections; notes on.....	2
<b>D</b>	
Defects. Notes on surface imperfections.....	4, 10
Definitions; regular, special.....	2
Dimensions and properties of sections: See properties.	
Dimensions for detailing American standard beams.....	32-35
Dimensions for detailing American standard channels.....	36-39
Dimensions for detailing Bethlehem joists and stanchions.....	31
Dimensions for detailing Bethlehem light beams and light columns.....	29
Dimensions for detailing Bethlehem wide-flange shapes.....	14-29
Dimensions for detailing special bulb angles, car building.....	66

	Pages
Dimensions for detailing special bulb angles, shipbuilding .....	64, 65
Dimensions for detailing special car building sections	
half center sill section.....	67
side plate section.....	67
side post section.....	67
W-side plate section.....	67
Dimensions for detailing special channels, car building and shipbuilding .....	58-63
Dimensions for detailing special zees.....	69
<b>F</b>	
Finish, notes on surface.....	4, 10
Flange slope, notes on.....	2
<b>G</b>	
General information.....	2
Gravity, of sections, center of: See properties.	
Gyration of sections, radius of: See properties.	
<b>I</b>	
Imperfections, notes on surface .....	4, 10
Increasing areas and weights of structural shapes.....	3
Inertia, moment of. See properties of desired shape.	
<b>J</b>	
Joists, dimensions for detailing and properties of Bethlehem.....	30, 31
<b>L</b>	
Light beams and light columns, properties of and dimensions for detailing	
Bethlehem.....	28-29
List of special shapes (PART II).....	57
<b>M</b>	
Methods of rolling .....	3
Mill practices, standard.....	5-11
Modulus of sections, section: See properties.	
Moment of inertia: See properties of desired section.	
<b>N</b>	
Notes on Bethlehem structural (split beam) tees.....	49
Notes on cambering .....	4, 11
Notes on surface finish.....	4, 10
<b>P</b>	
PART I—Shapes.....	13-56
PART II—Special shapes.....	57-69
Piling, properties of Bethlehem bearing piles.....	48
Piling, dimensions and properties of Bethlehem Steel Sheet.....	46, 47
Positions for measuring camber and sweep.....	9
Practices, standard mill.....	5-11
Properties and dimensions of American standard beams.....	32-35
Properties and dimensions of American standard channels.....	36-39
Properties and dimensions of angles, equal legs.....	40, 41
Properties and dimensions of angles, unequal legs.....	42-45
Properties and dimensions of Bethlehem bearing piles.....	48
Properties and dimensions of Bethlehem steel sheet piling.....	46, 47
Properties and dimensions of Bethlehem joists and stanchions.....	30, 31
Properties and dimensions of Bethlehem light beams.....	28-29
Properties and dimensions of Bethlehem structural (split beam) tees.....	49-56
Properties and dimensions of Bethlehem wide-flange shapes.....	14-29
Properties and dimensions of special bulb angles, car building .....	66

	Pages
Properties and dimensions of special bulb angles, shipbuilding.....	64, 65
Properties and dimensions of special car building sections.....	
half center sill section.....	67
side plate section.....	67
side post section.....	67
W-side plate section.....	67
Properties and dimensions of special channels, car building and shipbuilding.....	58-63
Properties and dimensions of special zees.....	68, 69
Properties, methods of computing.....	2
<b>R</b>	
Radius of gyration of sections: See properties.	
Regular, definition.....	4-11
Regular tolerances, specifications on surface finish and cambering limits.....	
Rolling and cutting tolerances. See tolerances.	
Rolling methods.....	3
<b>S</b>	
Section modulus of sections: See properties.	
Shapes, PART I.....	13-56
Shapes, special—PART II.....	57-69
Shipbuilding bulb angles, dimensions and properties of special.....	64, 65
Shipbuilding channels, dimensions and properties of special car building and.....	58-63
Slope of flanges, notes on.....	2
Special shapes, definition and list of.....	2, 57
Specification of steel, notes on.....	3
Stanchions, dimensions and properties of Bethlehem.....	30, 31
Standard mill practices.....	4-11
Steel quality, notes on.....	3
Steel sheet piling, dimensions and properties of.....	46, 47
Surface finish.....	10
Surface imperfections, removal of.....	4, 10
Sweep and camber, positions for measuring.....	9
Symbols, list of.....	12
<b>T</b>	
Tees, angles, bulb angles and zees, rolling and cutting tolerances.....	8
Tees, notes on Bethlehem structural (split beam).....	49
Tees, properties of Bethlehem structural (split beam) and dimensions.....	50-56
Tolerances, American standard beams and channels, rolling and cutting.....	7
Tolerances, angles, bulb angles, tees and zees, rolling and cutting.....	8
Tolerances, Bethlehem wide-flange shapes, rolling and cutting.....	6
Tolerances, channels, rolling and cutting.....	7
Tolerances, notes on (standard mill practices).....	4
<b>W</b>	
Wear of rolls.....	2, 4
Weight of steel, unit.....	3
Weights, methods of computing.....	2
Weights of standard, special, and miscellaneous regular material; See section desired.	
Wide-flange Bethlehem shapes, rolling and cutting tolerances.....	6
Wide-flange shapes, cambering of Bethlehem.....	4, 9, 11
Wide-flange shapes, dimensions and properties of Bethlehem.....	14-29
<b>Z</b>	
Zees, bulb angles, tees, and angles, rolling and cutting tolerances for.....	8
Zees, dimensions and properties of special.....	68, 69

BETHLEHEM STEEL COMPANY  
GENERAL OFFICES: BETHLEHEM, PA.



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Springfield 3, Mass.	44 Vernon St.
Syracuse 2	420 East Genesee St.
Toledo 2	811 Madison Ave.
Tulsa 19	1810 South Baltimore Ave.
Washington 6, D. C.	1000 Sixteenth St., N.W.
York	25 North Duke St.

## PACIFIC COAST DIVISION

**GENERAL OFFICES: SAN FRANCISCO 19, 20TH AND ILLINOIS STREETS**

### *Sales Offices*

Los Angeles	6000 South Boyle Ave., Vernon
Phoenix	3550 North Central Ave.
Portland 5	1010 Southwest 14th Ave.
Salt Lake City 11	455 East Fourth South
San Francisco 19	100 California St.
Seattle 4	4045 Delridge Way
Spokane 4	West 725 Sprague Ave.

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